THIS WEEK'S NATIONAL PETROLEUM NEWS

The Recognized Authority on News, Markets and Technical Developments in the Oil Industry

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Coming Meetings

Nebraska Petroleum Marketers, Inc., Paxton Hotel, Omaha, Nebr., Dec. 3, 4, 5.

1936

Wisconsin Petroleum Association, Plankinton Hotel, Milwaukee, Wis., Jan. 7, 8, 9 .

Northwest Petroleum Association, North Dakota division, Waldorf Hotel, Fargo, N. D., Jan. 13, 14.

Northwest Petroleum Assoc., Minnesota division, Ryan Hotel, St. Paul, Jan. 16 and 17.

Kentucky Petroleum Marketers Association, 10th annual meeting, Brown Hotel, Louisville, Ky., Feb. 5, 6.

Ohio Petroleum Marketers Association, Hotel Deshler-Wallick, Columbus, Ohio, Feb. 25, 26, 27.

Oil Men's Association of New England, Boston, Mass., Mar. 11, 12.

American Association of Petroleum Geologists, annual meeting, Tulsa, Mar. 19, 20, 21.

American Chemical Society, Petroleum Division, Kansas City, Mo., Apr. 13 to 17.

National Petroleum Association, Cleveland Hotel, Cleveland, O., Apr. 16, 17, 18.

Natural Gasoline Association of America, Mayo Hotel, Tulsa, Okla., May 13, 14, 15.

International Petroleum Exposition and Congress, Tulsa, Okla., May 16 to 23.

Pennsylvania Grade Crude Oil Assn., 13th annual meeting, State College, Pa., June 18, 19.

American Society for Testing Materials, annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J., June 20 to July 3.

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R. D. Matthews

R. D. Matthews, executive vice president of the Union Oil Company of California, is chairman of the finance committee that has been working for success of the annual meeting of the American Petroleum Institute at Los Angeles, Nov. 11 to 14.

Since 1914, when he first became connected with the oil industry as controller of the Union Oil Co., Mr. Matthews has taken an active part in the development of that company. His executive duties have included the reorganization and extension of the controller's office, the manufacturing group, and the domestic and foreign sales departments.

For several years Mr. Matthews has been director of the marketing division of the Institute. He has occupied his present position with the company since 1931 and from the point of service is the second oldest director of the company, having been a director and member of the executive committee since 1914.

NATIONAL PETROLEUM NEWS

VOLUME 27 NUMBER 46

Danger of Federal Control of Oil Past Col. Thompson Tells Institute

By Teletype
LOS ANGELES, Nov. 12

THE spectre of federal control of the oil industry has been definitely laid, Col. Ernest O. Thompson, chairman of the Texas Railroad Commission, told the American Petroleum Institute at its meeting here.

Col. Thompson, who is also a prime mover in the interstate oil compact, departed from the title of his published address to give his views as to why the country is now against social experiments, including government control over oil.

"I am going to give you briefly my reasons for thinking that the federal program is permanently out," he said.

"Legislation is enacted only in response to an insistent demand. The demand for this particular type of federal legislation was generally assumed to have originated with the public —presumably with the consumer public.

"However, during my attendance at the hearings before the congressional committee in Washington, I was amazed at the little interest shown by any consumer class as such, or by the representatives of those states that had no oil production. From what we call the general public there was no urge whatever for this legislation. It was suggested that the public should be interested because of price and because of conservation.

"The hearings made clear why the public was not interested. The committees heard much evidence on both prices and on the effect of the legislation on conservation. The facts are that for the last 15 years prices of petroleum products, except for taxes, have drifted irregularly lower and the quality of those products has improved.

"The industry has steadily developed its organization and its technology. It has passed on the improvements to the consumer in the form of decreasing prices and better quality. He has no reason to complain and, of course, will not.

"Very much the same thing was developed on conservation. It was made clear that the nation still has a very enormous quantity of crude oil underground, enough for a great many years and that the ultimate exhaustion of the petroleum resources is no longer such a vital matter.

"Other types of carbon can be made into gasoline even now at a very reasonable cost and advances in that particular branch of chemistry are going forward so rapidly that long before our crude is completely used up, these other sources will be furnishing an ample supply of gasoline at perhaps no greater cost.

"We, of course, all know that the drive for federal control came from within the industry. It was initiated because of three things: First, state control of production in 1933 was not effective. Second, the formulas of allocation were not satisfactory to the groups that were seeking the change. Third, there was a general recognition that national production must be balanced to the national market, and there seemed then to be no way in which the producing states could operate collectively to bring this about.

"These objectives were, of course, desirable to the proponents of the legislation, but it very quickly became clear that, with a bureaucracy established in Washington, there would be an increasing interference with labor, with marketing and with refinery and pipeline operations, as well as with production.

"In short, the control would so evoke as to give the industry what amounts to a utility status. Such a price was entirely too high, and there was a rapid reversal of position by the interests who were originally for the legislation. Those same interests, of course, have no de-

sire at this time for legislation of this character.

"In Texas we have always contended that Congress is without power to enact such legislation and the decisions that have come down recently seem to sustain us. I, for one, am firmly convinced that the Supreme Court will strike down any act of Congress that attempts to take away from the state of Texas, or any other oil producing state, the control over its oil resources.

"There is still another thought. It has been the history of the American people that they will try social experiments only in time of emergencies and of distress. In 1933, along with the tremendous flood of new deal legislation and the public urge behind it, legislation of this kind might have been enacted. Prosperity is now returning.

"The nation is definitely set against further social experiments. The tide is ebbing fast, and when the tide recedes the waves do not make new high-water marks. For all of these reasons, I feel quite certain that we have heard the last of the federal control movement."

Col. Thompson then explained at some length the things which the Texas Railroad Commission has done and is trying to do to effect fair and equitable proration of Texas oil fields, to the end that conservation may be effected. He asserted that Texans do not want the laws of the state administered so as to bring about lower prices and that most of them believe the price should be higher.

He asserted that Texas is wholeheartedly behind the Interstate Compact, believing that it is the only constitutional method for the solution of the common problems in the oil producing states.

A. P. I. Directors Vote to Publish Survey of Oil Industry Status

By Teletype

LOS ANGELES, Nov. 12

AS SERENE as the much advertised weather of this part of California is the sixteenth annual meeting of the American Petroleum Institute. It is, thus far, devoid of those controversial questions of political importance which have featured many meetings in recent years.

The 1600 who were registered Tuesday morning had not gotten into the full swing of the convention, as Monday was given to routine committee meetings and observance of Armistice Day in the numerous ways which this country permits.

Directors held their meeting Monday night, discussed the report of the executive committee which summarizes the present position of the industry and its outlet. Directors gave approval to this summary and voted to print the full report of the three committees recently appointed to make the survey.

The full report is voluminous and is, in effect, a bringing up to date of the Institute's well known "American Petroleum Supply and Demand" published in 1925.

This summary of the final report, released at the present meeting, constitutes the institute's declaration on the broad questions of industrial control which have held the center of the stage for the past two years and which are almost certain to be reasserted in the coming Congress. The report of the executive committee begins by saying:

"The petroleum industry as we know it had its beginning with the discovery in 1859, that petroleum could be produced from the earth by drilling. Ever since that time there have been periodic manifestations of apprehension lest petroleum resources be exhausted; and in the last two or three years, despite that the industry has been suffering from a surplus rather than a deficiency of petroleum, there has been insistent revival of the alarms.

"The fact that proven reserves of oil in the ground are now conceded by authorities to be well over 100 per cent greater than in the 1925 estimate, has had no influence with the alarmists. They have not only insisted our reserves were in danger of early exhaustion but have charged the industry with waste and an unwillingness or inability to co-operate in conservation—threatening rigorous governmental control, to the point of declaring the industry a public utility, in order to protect the nation's future oil supply.

"Ignorance and misrepresentation of the facts have persistently characterized attacks on the industry; the American Petroleum Institute has deemed it imperative to state the facts. The present report on the current position of the industry and the outlook for the future is its broad general refutation of the allegations against it, and its presentation in some detail of the evidence in support of that refutation."

The report asserts that the proven reserves of oil today are more than 12,000,000,000 barrels. It points out that the technique of oil finding and production has been improved so greatly since the 1925 report was made that "whoever is familiar with the facts concedes that the reserves still to be located and developed are much greater than they have ever before been estimated."

A friendly pat on the back was given to the interstate compact in the report. Last year, the institute directors voted their approval of the idea; since then, a compact has been set up with six states as members. "In it," said the institute executive committee, "are the potentialities for regularizing the industry without regimenting it; for assuring conservation, without destroying competition; for protecting initiative and enterprise; for ending the demoralizing alternation of flood and drought; and for insuring the fullest possible recovery from our reserves of petroleum".

As to demand, the committee saw a bright future. In 1935, it said, the average motor vehicle is using 690 gallons of

(*Continued on page* 14)

The Editor's Viewpoint

Guffey Act Enforcement Follows Familiar Pattern

THE oil industry would do well to keep an eye on operation of the new Guffey Law which virtually makes a "public utility" out of the bituminous coal industry. If it succeeds to the satisfaction of the New Dealers, there is little doubt but that a similar move to straitjacket the oil industry will be made.

A National Bituminous Coal Commission, which will fix prices and otherwise run the coal industry from now on, has been set up in the Interior Department. With coal now under his control, Ex-Dictator Ickes will be eager to resume his grasp on the oil industry which was freed of its shackles May 27 when the Supreme Court killed the NIRA and its codes.

When Congress returns January 3, it will probably find the coal people on the Capitol steps clamoring for a law to regulate the oil industry or at least renewing its demands for a tax on oil to "equalize competition" with coal.

It will be recalled that the coal people had an amendment offered in the Senate when the Guffey Bill was being considered which would have put a tax of 21 cents a barrel on all crude oil produced in the United States.

The Guffey Coal Law seeks to compel all coal producers to accept a code of marketing practices and labor regulations by imposing a tax of 15 per cent on the sales price of all coal produced and refunding 90 per cent of this to producers "accepting" the code.

While proposals barring the mails to producers not "accepting" the code and directing the Interstate Commerce Commission to refuse the extension of railroad facilities to such mines were knocked out when Congress passed the Guffey Bill, others of equal coerciveness were left in.

Already the coal industry is becoming familiar with the kind of boycott tactics tried by Ickes against the oil industry last spring to force compliance with labor union demands.

When the effective date of the new coal law found less than 2000 of the 15,000 coal producers signed up for the code, the coal commission unleashed its blacksnake whip. Attention was called to Section 14 of the Guffey Law. This provision authorizes a boycott by the Government.

Section 14 starts out with a prohibition against any department or agency of the federal government buying coal from a producer not subscribing to the coal code. It goes on to say that all government contracts shall contain a provision prohibiting the contractor from using any coal on or in carrying out the contract from any producer who has not been okayed by the coal commission.

Even strictly construed (and you can count on the New Dealers straining it to the limit) that provision appears to apply even to railroads and steamships carrying the mail and to all kinds of contractors furnishing materials or supplies to the Government (yes, even oil companies if they use coal).

It immediately brings to mind what the coal producers will have to do to get the coal commission's blessing. Undoubtedly, it will mean complete and abject submission to the demands of the labor unions—for it was their pressure on the White House which caused President Roosevelt to ask Congress to enact the Guffey Bill despite any "doubt, however reasonable", the members might have about its constitutionality.

It will be recalled that last May Ickes, then Oil Dictator, sought to have the big crude-purchasing companies boycott a small Oklahoma producer or be barred from government business. Prior to that two larger oil companies were banned from government bidding because they had not submitted to dictation from the union. Undoubtedly, similar tactics will be used on recalcitrant coal producers.

Many states have laws against boycotts. The unfairness of this method of forcing acceptance of a plan which cannot stand on its own merits is generally recognized. It is a sad state of affairs when the government itself resorts to boycott to force an unwilling majority to accept a code. Without such coercive tactics many producers probably would absorb the 15 per cent sales tax rather than submit to regimentation and domination by the labor unions.

Already several coal producers have rushed into court in an effort to stave off imposition of the code shackles. The oil industry is awaiting the outcome of such court tests with sympathetic interest.

A. P. I. Meeting

(*Continued from page* 12)

motor fuel annually. This is expected to increase to 750 gallons in 1940, partly because of the increase in the use of trucks. After 1940 motor improvements will cut per car consumption again. The committee looked ahead to 1960, had a vision of 31,100,000 passenger cars in use by that time, compared to 22,400,000 now and six million trucks as against 3,600,000 now.

Peak demand for oil of 1,109,800,000 barrels was foreseen by the committee in 1950. It expects demand to drop by 1960 to 1,071,020,000 barrels, as compared with 719,500,000 barrels used in the U. S. in 1935.

The lesser demand will be due to continued improvement in refining. The committee looks forward to a gasoline yield of 57.88 per cent in 1960 as compared with 43.76 per cent today.

The committee asserted that the oil industry is highly competitive and not in any sense monopolistic. As proof of this it pointed to the reduction of retail gasoline prices from an average of 29.74 cents per gallon in 1920 to 13.64 cents per gallon in 1934.

"Further to emphasize our insistence that there is no monopolistic or other condition because of which the industry deserves punitive treatment at the hands of the government, the low price which the American motorist pays for motor fuel should be compared with the much higher prices in other countries, notwithstanding that a number of such foreign countries produce all of their own crude oil," the committee said.

"All monopolies are bad, but government monopolies have invariably been the worst of all. They exclude the driving forces of invention, enterprise, improvement, efficiency; they always tend to freeze the monopolized industry in the phase of development in which the governmental bureaucracy found it."

Earnings of the industry also are indicative of lack of monopoly, as they have been exceedingly modest, it is pointed out. In the past 12 years the average earnings of the industry have been 1.66 per cent on capital invested. In three years there has been a deficit and peak earnings were 4.96 per cent, the committee reported.

The oil industry frequently is held up as a horrible example of waste in duplication of distributing facilities but this alleged waste has not increased costs to the consumer unduly the committee pointed out. It quoted a recent study of marketing costs made by National Cash Register Co. to show that oil has lower costs than other retail lines with the exception of groceries. Lines covered in the survey included department stores, druggists, shoe stores, restaurants, furniture stores, florists, jewelers, specialty stores, stationers, variety chains, automobile jobbers, electrical supplies, groceries and motor fuel.

A vigorous protest against proposals for divorcement of pipelines from the industry was voiced by the committee. It pointed out that to move such low value, bulky products without the lines would increase costs vastly.

At present one sixth of the entire investment in the oil industry, two billion dollars, is in transportation facilities. Oil owns 26.5 per cent of American maritime tonnage of 1000 tons and over, the report brought out.

As an employer of labor the industry has been of great importance to the nation, the committee reported. Re-employment has been rapid since the trough of the depression. The industry has co-operated by reducing hours 30 per cent. Wages in refining and producing are at high levels.

The committee concluded its survey by expressing its convictions on 10 important points as follows:

"1. There is every reason for confidence that the requirements of petroleum products to meet national needs and the demands of the consuming public will be met.

"2. The known reserves are today well over 100 per cent larger than those estimated 10 years ago, or at any time previous to 1925. These reserves should not be drawn upon at a rate more rapid than will be consistent with the ultimate recovery from them of the maximum required products. Thus managed, the reserves, together with new discoveries, which on the basis of experience we may confidently anticipate, should relieve us of any possible apprehension regarding our supplies over the next 25 years.

"3. At the expiration of this 25-year period, or indeed at any other future time, there will still be sound insurance against any crisis concerning petroleum supplies. This insurance includes the certainty of large additional recoveries from old oil fields, which are not estimated in the present survey, but which improved methods of recovery will assuredly make available. Beyond this, in the further background, are the practically unlimited reserves from substitutes (coal and oil shales) waiting to be developed whenever economic conditions justify. With greater confidence than has ever before been possible, the assurance can be given that requirements will be met.

"4. Each generation is entitled to the use of those resources which it finds at its hand; but it is not entitled to waste them. The price for crude oil should always be such as to insure production in sufficient quantities, at a reasonable profit. Under these conditions, oil will be produced by the best methods and with a view to the largest ultimate recovery from each field. As conditions justify, we may confidently rely upon the continued development of better methods in recovery, and progressive economy in utilization.

"5. Because transportation is so vital, the industry has developed—as part of its plant—a complete, articulated, economical, and independent transportation system. This system perfectly meets the industry's requirements, and has no possible usefulness to any other industry. Therefore, we insist that no part of our transportation facilities should be severed from the body of the industry. Such severance would inevitably impair efficiency, add to

the expense of operations, and increase the cost of products to the consumer. There is no significant demand for pipe-line divorcement but, rather, an overwhelming preponderance of opposition.

"6. Unremitting prosecution of scientific research and practical experiment in refining have served the public's interest by multiplying the industry's products, widening their fields of usefulness, and reducing their costs. New demands have persistently arisen, and just as persistently have been met. New processes have been devised and old ones bettered, regardless of expense or effort. Versatility, adaptability, and economy have guided the industry's advance under the urge of competitive conditions.

"7. Among employers and employees alike, there is such general satisfaction with labor conditions as we believe could be matched in few other industries. This is true as to wages, working conditions, and all factors which make for relationships of mutual confidence and loyalty; and throughout the years of depression employment has been maintained without sacrifice of traditional high standards.

"8. In the last 15 years this industry has become the greatest single contributor to public revenues; it produces 11 per cent of all taxes paid into government treasuries. These excessive and discriminatory taxes add heavily to the prices which consumers must pay for petroleum products, and are responsible for many of the industry's most difficult problems.

"9. Government domination would remove the urge and paralyze the forces that have made for progress. It would mean calamity to the industry, and disaster to the public. The record shows how invariably the benefit of economies, invention, and improvement has been passed on to the public in lower prices, better products and service. On that record we bespeak a candid, considerate judgment—confident that it will favor continuance of the industry's independence and self-control.

"10. This most typically American industry has been created in the last three-quarters of a century. No other industry has faced so complex a situation by reason of the peculiar and fugitive character of its raw material. It has met the tremendous responsibilities both in peace and in war, and has never failed in their discharge. We have every confidence that it will not fail in the future, unless prevented by governmental restrictions."

A. P. I. Directors for 1936 Nominated

By Teletype

LOS ANGELES, Nov. 12. — The Board of councillors of the A.P.I. today recommended the following be elected as directors:

Production group; Pacific Coast: W. C. McDuffie, Pacific Western Oil Co., Los Angeles; S. Belither, Shell Oil Co., San Francisco. Rocky Mountain: B. B. Brooks, Consolidated Royalty Oil Co., Casper, Wyo. Central U. S.: Burdette Blue, Indian Territory Illuminating Oil Co., Bartlesville, Okla.; C. F. Roeser, Roeser and Pendleton, Inc., Fort Worth; J. Edgar Pew, Sun Oil Co., Philadelphia. Eastern U. S.: O. D. Donnell, Ohio Oil Co., Findlay, O.

MANUFACTURING Group: Pacific Coast: R. D. Mathews, Union Oil Co., Los Angeles. Rocky Mountain: T. A. Dines, Salt Creek Producers Association, Denver, Colo. Central U. S.: P. M. Miskell, Empire Refineries, Inc., Tulsa. Eastern U. S.: C. L. Suhr, Pennzoil Co., Oil City, Pa.

Distribution Group: Rocky Mountain: W. H. Ferguson, Continental Oil Co., Denver, Colo. Central U. S.: E. G. Seubert, Standard Oil Co. (Indiana), Chicago. Eastern U. S.: W. T. Holliday, Standard Oil Co. of Ohio, Cleveland, O.

Transportation Group: Pipelines; D. S. Bushnell, Northern Group of Pipe Lines, New York; Tank Cars: L. J. Drake, Union Tank Car Co., Chicago; Supply Group: John A. Geismar, National Supply Co., Toledo, O.; Natural Gas Group: T. B. Gregory, Manufacturers Light and Heat Co., Pittsburgh; Natural Gasoline Casinghead Group: D. E. Buchanan, Hanlon-Buchanan, Inc., Tulsa.

Foreign Trade Group: Far East: H. D. Collier, Standard Oil Co. of California, San Francisco; Mexico and South America: Richard Airey, Asiatic Petroleum Co., New York.

At Large Group: W. N. Davis, Phillips Petroleum Co., Bartlesville, Okla.; Frank Coates, Henry L. Doherty & Co., New York; R. C. Holmes, New York; F. A. Leovy, Gulf Production Co., Pittsburgh; J. F. Lucey, Lucey Petroleum Co., Dallas; E. W. Marland, Ponca City, Okla.; H. C. Weiss, Humble Oil & Refining Co., Houston; E. B. Reeser, Barnsdall Oil Corp., Tulsa; H. F. Sinclair, Consolidated Oil Corp., New York; J. W. Van Dyke, Atlantic Refining Co., Philadelphia; J. D. Collett, O'Keefe and Collett, Fort Worth, Texas; H. T. Klein, The Texas Co., New York.

The Board of councillors also recommended the following:

That the natural gasoline (casinghead) group be represented by an additional director; they recommended W. K. Warren, Warren Petroleum Co., Tulsa, Okla., be elected for a term of one year.

That the natural gas group be represented by an additional director; they recommended Wm. Moeller, Jr., Southern California Gas Co., Los Angeles.

That Pipeline Group be represented by an additional director; leaving the name of individual to the board of directors.

That the At-Large Group elected by councillors be increased by three directors and that the following gentlemen be elected to fill these vacancies: Jake L. Hamon, Dallas; Alexander Fraser, Shell Petroleum Co., St. Louis, and N. V. V. Franchot, Franchot & Co., Olean, N. Y.

Councillors also voted to suggest to Board of Directors and executive committee that next annual meeting of the Institute be held in Chicago.

This modern appearing lubritorium, built 13 years ago, comes back into the hands of the Trimbles, who have re-entered the oil business at Indianapolis after six years' absence. Their new service station and office is to the right

Trimbles Back in Oil Business As Indianapolis Marketers

INDIANAPOLIS, Nov. 18 "SILVER FLASH" J. H. Trimble and his son W. H., are back in the oil business again and at their old stand in Indianapolis. This time they have only a service station with a supporting bulk station and thereby hangs the tale of their getting back in the oil business.

Six years ago J. H. Trimble made probably the largest sale of a jobbing business in history when he sold his Western Oil Refining Co. here to the Shell Petroleum Corp. At the time of this sale, in 1929, the Western company had 45 branch bulk stations and 213 service stations over Indiana, parts of Illinois and Ohio, aside from the main plant and warehouse in Indianapolis.

In Indianapolis alone, Western had 56 service stations which sold more gasoline every month than the Standard and three times as much as the next nearest competitor. With advertising and electric signs, some costing $600 apiece, the company made its premium gasoline "Silver Flash" famous and at the time of the sale was selling, in all, around 50,000,000 gallons of gasoline a year.

Organized in 1910 by J. H. Trimble, the company started off with three employes. His two sons, Bob and Bill, eventually entered the business as well as two sons-in-law. The company built the first service station and the first greasing station in Indiana.

The lubritorium shown in the accompanying picture, was built in 1922. The fact that this all-glass, arch-roofed structure, resembling a modern airplane hangar in appearance, is not outmoded after 13 years, testifies to the foresight of its designer, J. H. Trimble. In fact, in describing this lubritorium in its Dec. 6, 1922 issue, NATIONAL PETROLEUM NEWS said: "It gives every indication of being there to stay." It covers 3000 square feet, and handles 20 cars. Platforms are built into the basement so that attendants may stand on them and work at ease.

When J. H. sold the business, the two sons retired eventually. They owned in fee the corner property on Meridian Ave. which had their office building and one of their best service stations. This they leased to the Shell when they sold out. The lease ran out this year and they were unable to agree with the Shell on renewal terms, so they took over the property and resumed business to help carry the charges on the property. Their contract with the Shell to stay out of business had also run out.

J. H. Trimble is keeping a weather eye on the business himself. The active management is with his son W. H. The two operate as the Trimble Oil Corp. They tore down the old station office building and erected a simple tile building for the office and service station as shown in the photograph and put in new computing type pumps, concreted the whole area, painted it all up and have been building their business rapidly the three months that the place has been open.

They are selling a 68-70 octane gasoline at the same price as third-grade. They are selling a benzol blend of 74 octane at 1½ cents over their regular gasoline. They have put in a bulk station and trucks sufficient to handle business at this station. What all they will do in the oil business is a problem that they are still considering as they primarily are in the real estate business today.

Name Host for Exposition

TULSA, Nov. 7.—Hosts for each of the days the International Petroleum Exposition is in progress were named at an organization meeting Nov. 5 of a Tulsa committee named to supervise the hospitality planned for visiting oil men.

The hosts are W. G. Skelly,

Skelly Oil Co.; R. W. McDowell, Mid-Continent Petroleum Corp.; George S. Rollin, Shell Petroleum Corp.; Ralph Dietler, Stanolind Oil Co.; R. B. Pringle, Tidewater Oil Corp.; A. O. Olson, Olson Drilling Co.; W. R. Francisco, Deep Rock Oil Corp., and E. B. Reeser, Barnsdall Oil Corp.

Tanker Rate Hike Boosts Eastern Markets

By Teletype

NEW YORK, Nov. 11.—The rapid rise in charter rates for movement from the Gulf Coast to North Atlantic ports, which has been taking place for the past 45 days, is playing an important part in the market setup for gasoline and fuel oils along the Eastern Seaboard.

The higher prices are prevailing for both "clean" and "dirty" boats, and cargo buyers, who have been moving gasoline, kerosine and fuel oils, say that at present boats are practically unobtainable in the open market.

A comparison of charter rates late in September and those prevailing today, shows that rates for both clean and dirty boats have advanced over 13 cents per barrel. At that time shippers of light fuel oils from the Gulf to New York Harbor could obtain a boat for approximately 14 cents a barrel, compared to a fixture at 27 cents which took place the past week.

The rise in charters for clean boats has been on the same basis with rates of 16 cents a barrel prevailing late in September and 32 cents a barrel paid in the week ended Nov. 9. In addition to the tightness in the tanker market, suppliers of gasoline at New York Harbor say that barges also are hard to obtain for prompt loading.

An example of the effect the higher charter rates have on the Eastern market situation is seen in the bunker oils. The selling price for Bunker C. fuel, in cargo lots, has been at 70 cents a barrel f.o.b. the Gulf, and 95 cents at New York Harbor since September. During September, with the tanker rate for heavy crude at 15 to 16 cents a barrel, it could be delivered at New York for around 85 cents, leaving a margin for other expenses and profit. However, today with the tanker rates around 28 cents for heavy crude, the laid down price at the harbor is about 98 cents, or 3 cents a barrel higher than the harbor selling price.

One reason for the 0.25-cent rise in tank car selling prices in gasoline, kerosine and fuel oil throughout New York and New England last week was the tightness in the charter market. Higher transportation costs made it necessary to widen the spread between the Gulf and the Seaboard markets.

Rating of Aviation Fuels Requires More Study

LOS ANGELES—Satisfactory correlation between the "motor method" laboratory ratings of aviation fuels with their behavior in representative full-scale aircraft engines was reported for several of the widely different types of fuels by C. B. Veal, secretary, Co-operative Fuel Research Committee of the Society of Automotive Engineers at the Annual Meeting of the American Petroleum Institute.

The program, worked out in May, 1933, provided for the investigation of three series of fuels:

1. Those whose knock characteristics are essentially unchanged under varying test conditions.

2. Those whose knock rating decreases sharply with increasing severity of test conditions.

3. Those whose knock rating improves with increasing severity of test conditions.

The correlation was satisfactory except for No. 1 fuel plus benzol and No. 3 plus lead which were somewhat overrated. The tests indicated that the performance of a particular benzol blend may vary within rather wide limits, depending on engine design and operating conditions.

In view of the fact that fuels of higher than 87 octane number will probably be in service use in the near future, no attempt to modify the motor method (in order to secure better correlation with the present data) will be made at this time.

Suggests Adapting Fuel Oil for Diesels

If co-operation between the engine builder and the refiner is possible, household-burner fuels can be developed which will be satisfactory for use in modern high-speed diesel engines, it is the opinion of William Mendius and W. Ainslee, of Sinclair Refining Co., and C. H. Schlesman of Socony-Vacuum Oil Co., authors of a paper on the development of high-speed diesel fuels presented at the A. P. I. meeting at Los Angeles.

The advantage gained by this development will be the use of the existing distribution systems. At the present time the great variety of fuel specifications, in spite of the 1935 diesel-fuel classification prepared by the American Society for Testing Materials, threatens to limit the widespread adoption of high-speed diesels, the authors state. They point out that the costs of distribution of diesel fuel will become excessive unless diesel builders and consumers are able to agree upon a smaller number of grades.

Examination of the characteristics of currently - produced burner fuels which are available in most districts of this country discloses the fact that No. 1 fuels generally have a cetene rating between 50 and 55; they have low viscosity of about 32 seconds; and they have a relatively low boiling range.

The No. 2 fuels have a somewhat higher boiling range; a viscosity range from 32 to 36, and cetene ratings approximating 45 to 50. The No. 3 fuels approach diesel-fuel boiling-range specifications; their viscosity ranges from 34 to 37, and their cetene rating may be classified as 40 to 45.

They all appear to be quite satisfactory with respect to carbon residue and sulfur. Their pour points are 0° F., or lower.

League Waits for the U. S. to Act On Oil Embargo Against Italy

NEW YORK, Nov. 11

THE United States has been jockeyed into an embarrassing position on the question of shipping oil to Italy. The League of Nations has decided on an embargo on oil, coal, steel and iron against Italy but has deferred putting it into effect pending action by the U. S. and Germany. So far as oil is concerned, the buck has been passed to the U. S. alone.

Without any definite assurance that other oil countries will take similar action, the U. S. is offered the choice of taking the first step to shut off Italy's oil supply or apparently blocking a collective effort to stop the Italo-Ethiopian war.

The dilemma is made more difficult by some doubt that President Roosevelt has power under the Neutrality Act to class oil as an "implement of war" and embargo its shipment to Italy. Of course, whatever steps are taken against Italy must likewise be applied to Ethiopia.

So far, the Roosevelt Administration's policy seems to be to stall until Congress meets in January and then seek specific authority to ban shipments of oil and other raw materials to belligerents. Indeed, Secretary of State Hull last week definitely indicated that the administration would seek broader powers under the Neutrality Act.

Meanwhile, the indications are that the administration will do all in its power to discourage trade with Italy (and Ethiopia) —even to the extent of further steps to arouse public opinion against exporters engaged in such trade. The Customs Bureau is considering making public the names of all firms trading with Italy. Other measures are being formulated.

With apparent widespread popular support for the President's steps to preserve peace, the administration is likely to succeed in fomenting animosity toward companies trading with Italy—even against those which are simply carrying on their normal business as do the oil companies which have built up trade in Italy.

Aside from the objection that Americans as neutrals should have the right to trade with whom they please, it is possible the administration's policy may react unfairly on companies which have investments in Italy.

However, oil company officials have consistently denied they have been approached by the government to withhold oil shipments from Italy.

So long as there is no legal prohibition by the U. S. against shipping oil to Italy, it is believed the Italian people might judge harshly any oil company here which would cut off the supply of its Italian subsidiaries and customers. Yet if the companies continue shipping to Italy, they may be subjected to unfavorable publicity in this country, as matters now stand.

EVEN if the Neutrality Act permits the President to embargo oil to Italy—which is doubted by many authorities both within the administration and outside—there is considerable argument against such a step. There is no certainty that other countries would follow.

For this country to make the first move in this direction might be regarded by the Italian government as an unfriendly act. Indeed, one authority suggests that imposition of a boycott on Italy by the U. S. might be received as an act of war.

Many believe the league's efforts, even if supported by the U. S. will be futile; that Italy will obtain an adequate oil supply in any event. They say it is folly for the U. S., a nonmember, to pull the league's chestnuts from the flames. They contend that the result can only be a gratuitous sacrifice of the Italian people's good will.

No Interest in Conference

By Teletype

WASHINGTON, Nov. 12.—The oil industry does not appear much interested in the conference here December 9, called by George L. Berry, co-ordinator for Industrial co-operation, to discuss a permanent NRA.

Several thousand replies to the invitations sent out to industrial and labor organizations have been received but the response from the oil industry has not been encouraging, it is understood. Co-ordinator Berry hopes that representatives of industry and labor will be able to get together around a table and agree on permanent industrial legislation.

Physicists' Tools Probe Lubrication Secrets

The physico-chemical forces emanating from metal surfaces and from certain polar molecules profoundly affect lubrication, particularly under boundary conditions it was disclosed at the American Petroleum Institute meeting in a paper by G. L. Clark and R. R. Sterrett, University of Illinois and B. H. Lincoln of Continental Oil Co. Evidence of the action of these forces has been found in various physical measurements which serve as preliminary indications of the adsorption of polar molecules to form oriented films.

The attractive forces between metal surfaces are neutralized by strongly-polar molecules, such as chlorinated esters of long-chain fatty acids and short-chain monohydric alcohols, so that lubrication is improved. This is accomplished by the formation of a film in which the polar molecules are firmly bound in an orderly fashion with respect to each other and to the metal surface, it was stated.

Under conditions of lubrication the regimentation of hydrocarbon molecules in the liquid body of the lubricant affords slippage planes of minimum resistance. These actions of polar films are of importance in explaining the anomalous

coefficients of friction in viscous lubrication, it was indicated.

X-ray investigation of adsorbed-film structures of pure compounds showed that the type of molecular building unit, regularity of arrangement, and the number of molecular layers formed depend upon what compound and what metal are used.

The fruitfulness of these studies was indicated in the demonstration of the stability, and resistance to disorganizing effect of temperature increases, of methyldichlorostearate blends. Many types of tests have been employed to prove that a film of the polar compound is beneficial in lubrication, it was stated, before it was accepted that lubricants containing methyldichlorostearate actually protect rubbing metal surfaces from wear.

In general, one of the clearest physical concepts of the mechanism of lubrication was presented by the authors of this paper that has ever been given, it is believed. It goes far beyond the measurement of lubricating quality by viscosity to the more fundamental and variable characteristics of both lubricating medium and lubricated surfaces.

Gas Tax Evasion Charges Filed in New Jersey

NEW YORK, Nov. 9.—Two New Jersey gasoline distributors have been arrested on charges of tax evasion and operation without a license, the American Petroleum Institute reports.

Joseph Augustine, of Trenton, was held under $32,000 bail as a result of 30 charges of importing and distributing gasoline without a license. Representatives of the state's motor fuel department charged that Augustine had imported more than 1,000,000 gallons of gasoline since July 1 without a license. Augustine entered a blanket denial of the charges.

Maxwell Sugurman, Mt. Holly, is being held in the Cumberland county jail on charges of importing gasoline without paying tax, and of operating a bulk gasoline plant and service station without licenses, the Institute reports.

NRA Magazine Advises Consumers How to Buy Motor Fuel

By Teletype

WASHINGTON, Nov. 12

A WARNING against paying any "significant differential" in price for branded gasoline is given consumers in an article appearing in the current issue of *The Consumer*, a monthly publication put out by the NRA consumers division.

The article, which has been widely-publicized in the newspapers, was prepared by Irene Till on the staff of Dr. W. H. Hamilton, the president's advisor on consumer problems. Miss Till is also author of *The Consumer* study of the oil code which has been sent to the White House.

MISS TILL somewhat naively "reveals" that in an attempt to save transportation costs there is a "rather general swapping of gasoline by the major companies behind the scenes."

Newspaper stories have played up the charge that the consumer is "wasting" his money in buying high-octane gasoline.

"Since the ordinary automobile engine is constructed for a medium or low octane gasoline," the article continues, "it is unreceptive to the higher octane, for which the consumer pays the differential."

Pursuing her "discovery" that gasoline has been standardized, the author states: "Moreover, since the major companies normally supply about 80 per cent of their needs, they are depending upon the various assortments of gasoline sold by the independents for the remainder of their supply. This is mixed with their own gasoline, branded and sold under their trade name.

"The consumer should be wary of paying any significant differential in price, because the pump has a familiar trade mark blazoned conspicuously on it."

The article also says that an independent may purchase branded gasoline from a major company and sell it as unbranded gasoline from one-half to five cents below the regular price.

The article purports to give a detailed explanation of the licensing system of the Ethyl Gasoline Corp., and discusses the relative position of "premium gasoline" and "Q" gasoline in the market today. Attention is called to complaints by independents about their "inability" to secure tetraethyl lead.

Another article in the same publication, contrasting how the the consumer is "remembered" in the Guffey Coal Law and "forgotten" in the Cole resolution ratifying the Interstate Oil Compact, is rich with unconscious irony.

"The contrast between the two measures," the article solemnly warns, "can teach the consumer much that he should remember if and when in the future other industries seek sanctuary from the uncertainties of competition in publicly authorized controls."

The author (Mark Adams, an ex - newspaperman) suggests that the compact resolution was a price-fixing measure.

"The oil regulation statute passed at the last session of Congress merely preserves this system of allocation without reference to costs and restriction of production which is subsidizing inefficient operation at the expense of the consumer," he states. "There is in it no provision at all to encourage low cost production in any way. There are not even labor provisions."

The NRA consumers' division publication is circulated among the county consumer councils throughout the country and the general public. An efficient publicity staff is likewise getting much space in the daily newspapers.

Independent Petroleum Association Directors Plan Year's Campaign

By Allen S. James
N. P. N. Staff Writer

DALLAS, Nov. 7

INITIAL planning of the coming year's program was undertaken by the executive committee of the Independent Petroleum Association of America, at a session here after the close of the convention.

The committee had before it a dozen or more resolutions from which to prepare the program, as well as a new plan of budget financing which, officials believe, will eliminate the financial worries of former years.

One of the resolutions outlined a five-point program to include:

(1) Federal legislation limiting definitely importation of foreign petroleum and its products, preferably to a fixed proportion of the national consumptive demand; (2) Orderly storage withdrawals in order to prevent a flooded market or a wrecked price structure; (3) A practicable method whereby domestic production would be held within limits of national consumptive demand with each state assured of its equitable and proper share of the total national production;

(4) Provision for planned and orderly development of new pools;

(5) Provision for voluntary agreements within the industry, subject to the approval by some federal agency.

To this resolution was added the statement that "while positively opposed to federal control of the petroleum industry, this association further places itself on record as convinced that a national problem requires a national program and that the assistance of the federal government may be properly invoked in order to protect the various oil-producing states in those interstate situations where the laws of single states have no authority."

Summaries of recommendations in other resolutions are:

(1) Elimination of federal tax on gasoline and lubricating oil and reduction by states of present levies with provision that such funds go only to highway construction.

(2) Request for investigation by the American Bar Association of "racketeering practices which have seriously disturbed this industry . . . . many of these racketeering practices having depended upon use of legal technicalities and obstructive legal procedure."

(3) Active support of the interstate oil compact and its commission.

(4) Maintenance of proper relation between supply and demand.

(5) Recognition by crude oil purchasers of the difference existing between present crude price and cost of materials.

(6) Adoption of an adequate tariff on imported crude oil and its products.

(7) Investigation by Congress of alleged discrimination against domestic asphalt in favor of imported asphalt.

(8) Appropriation of funds to continue the work of the Bureau of Mines in estimating market demand, if the Petroleum Administrative Board, now providing for the work, is unable to continue to do so.

(9) Investigation of alleged discrimination by the Bureau of Public Roads through its ruling that the requirements for American products to be used in highway construction shall not apply to asphalt.

(10) Limitation of withdrawals from storage.

(11) Appreciation to all who made the convention a success.

(12) Condemnation of: (a) Basing crude price upon selling price of products rather than selling price of products on cost of raw material; (b) selling crude or products below average cost; (c) "practice of some companies to post lower prices for new fields or fields which are isolated or which have no competitive pipe line connection; (d) cutting of prices to refill storage; (e) practice of some integrated companies which subsidize one branch of their business out of profits of another branch."

(13) Rescinding the Treasury Department's order exempting asphalt made from foreign petroleum from the provisions of the domestic origin law.

Recommendations of the nominating committee were followed in electing officers, with Charles F. Roeser of Fort Worth being chosen president to succeed the association's founder, Wirt Franklin.

Vice presidents elected were:

Arkansas—J. H. McFarland, El Dorado; California—B. A. Lasalle, San Diego; Colorado—Warrick Downing, Denver; Georgia—Wiley L. Moore, Atlanta; Illinois—T. B. Steele, Robinson; Indiana—Don Kirk, Terre Haute; Kansas—Genr Moriarty, Wichita; Kentucky—Paul G. Blazer, Ashland; Louisiana—W. Scott Heywood, Jennings; Massachusetts—A. A. C. Malcom, Haverhill; Michigan—H. D. Atha, Mount Pleasant; Missouri — Harry Ezzell, St. Louis; Montana—William Fulton, Shelby; New York—D. L. Sweeny, Buffalo; Ohio—J. P. Gordon, Columbus; Oklahoma (east)—C. P. McMahon, Tulsa, (west) Frank Buttram, Oklahoma City; New Mexico—Van S. Welch, Artesia; Pennsylvania — T. O. Grisell, Bradford; Washington — Tyler A. Ross, Wenatchee; West Virginia — W. S. Hallanan, Charleston; Wyoming—V. M. Kirk, Frannie.

OIL CITY—A campaign of winter advertising was approved at the October meeting of the Pennsylvania Grade Crude Oil Association board of directors. Natural qualities of Pennsylvania oils as winter lubricants will be stressed.

Independent Tells of Business Lost To Packers' Co-op. Association

By E. L. Barringer
N. P. N. Staff Writer

CHICAGO, Nov. 9

THE outcome of efforts of the Johnson High Test Oil Co., Freeport, Ill., to retain a packing plant account, serviced for several years at the tank wagon price, against Standard's packers co-operative supply discount, was related to NATIONAL PETROLEUM NEWS in a letter from Harold W. Johnson, head of the company.

Pressure of Indiana Standard's arrangement caused the jobber to relinquish the account after "meeting competition" down to 4 cents under the service station price, he said.

"We believe this experience to be convincing proof that it is a case of independent marketers meeting Standard Oil Co. prices, rather than Standard Oil Co. meeting independent oil company reduced prices," said Mr. Johnson in his letter.

"For a number of years we have sold the Blackhawk Produce Co. at Lanark, Ill., gasoline requirements consisting of from 300 to 600 gallons per month, making delivery to an underground tank and pump owned by my company at a price equal to the prevailing tank wagon price as their volume of purchases would not warrant the commercial or other forms of discount," the letter stated.

"The Blackhawk Produce Co. is controlled by Wilson & Co. Several months ago the purchasing agent of Wilson & Co. notified the manager of the Blackhawk Produce Co. to the effect that they could obtain a discount of 3.5 cents per gallon from the Standard Oil Co. As an experiment we met this increased discount schedule and retained the business.

"At a later date the purchasing agent of Wilson & Co. advised the manager of the Blackhawk Produce Co. that he had an even longer discount which was equal to 4 cents per gallon from the prevailing service station price. To continue the experiment we met this schedule of discounts.

"On Nov. 1 we are in receipt of a special delivery letter from the Standard Oil Co. sales department at Joliet, Ill., as follows:

" 'We have been advised by the Chicago office of Wilson & Co. that they are issuing instructions to the Blackhawk Produce Co. at Lanark to purchase their gasoline from them effective Nov. 1, 1935. We are therefore again requesting that you invoice us for the equipment at the above location and will appreciate a letter authorizing us to begin dumping at once. Signed by H. E. Hanson (Joliet division manager).'

"After receipt of this letter we contacted the manager of the Blackhawk Produce Co. at Lanark who advised us that he had received instructions from Wilson & Co. to purchase their gasoline requirements from the Standard Oil Co. of Indiana.

"We believe it is obvious that their discount is in excess of 4 cents per gallon although their purchases would entitle them to the usual tank wagon price posting." Mr. Johnson concluded.

IN THE parlance of oil marketers the deal is the Standard Oil Co. supplying the meat packers, a consumers co-operative. Actually, however, the arrangement is between the Indiana Standard and the Manufacturers Co-operative Association, Chicago.

The Manufacturers Co-operative Association, which succeeded the old meat packers gasoline buying arrangement, was incorporated in Illinois Oct. 11, 1934. Stockholders are limited to "only persons and corporations engaged in manufacturing, or the wholesaling of manufactured products, or in representing the interests of manufacturers." Ownership of stock is limited to five shares for each member.

The association, according to the by-laws, is to operate on a co-operative basis. After surplus and reserves, as determined by the board, are set aside, all income is to be distributed to shareholders. The by-laws require patronage dividends to be distributed March 15 and Sept. 15 each year.

The co-operative is not to be confused with the Institute of American Meat Packers, at the same Chicago address. Many institute members, but not all, are shareholders in the Manufacturers Co-operative Association. Wm. Whitfield Woods, head of the institute, was one of the original shareholders in the co-operative.

Members of the co-operative do not buy the gasoline under this arrangement from the oil company. The co-operative is the buyer, and the dealings of the gasoline supply company are with the co-op, not its members.

Crude Stocks Show First Increase Since June

WASHINGTON, Nov. 12.—For the first time since June 1, domestic crude oil stocks increased during the week ended Nov. 2, the Bureau of Mines reported today. Domestic oils were up 246,000 barrels, but a decrease of 253,000 barrels in foreign oils resulted in a net decline of 7000 barrels from the previous week. Total crude stocks on Nov. 2 were 300,983,000 barrels. Total stocks a year ago were 331,876,000 barrels.

Grade of Crude	Nov. 2	Oct. 26	Change (Thousands of Barrels)
Penna. grade	4,705	4,690	+ 15
Other Appala.	801	816	— 15
Lima.-N. E. Ind.-Mich.	1,512	1,585	— 73
Ill.-S. W. Ind.	11,137	11,183	— 46
N. La.-Ark.	10,633	10,553	+ 80
W. Tex.-S. E. N. Mex.	29,555	29,281	+274
East Texas	23,544	22,552	+992
Other Mid-Cont.	133,323	133,857	—534
Gulf Coast	25,137	25,384	—247
Rocky Mountain	26,840	26,886	— 46
California	30,899	31,053	—154
Domestic	298,086	297,840	+246
Foreign	2,897	3,150	—253
Total crude	300,983	300,990	— 7

Michigan Jobber Tells Committee Of Contract Difficulties

By L. D. McGuan
N. P. N. Staff Writer

LANSING, Nov. 8

DIPPING again into the subject of oil marketing, the Michigan legislative committee last week confined itself to the taking of testimony of one independent Michigan jobber.

While it was indicated at previous hearings that A. S. Hickcock, president and W. G. Kirkbride, vice-president, and counsel for the Hickock Oil Corp. were to testify Nov. 7 or 8, reports now are to the effect that they will be reserved until a later hearing, if called at all.

T. R. Strong, partner in the firm of F. & S. Oil Co., Ithica, Michigan, was questioned by Gordon E. Tappan, special assistant attorney general, conducting the hearings for the committee. Mr. Strong testified to difficulties he had encountered when he attempted to switch his source of supply from the White Star division of the Socony-Vacuum Oil Corp. to Phillips Petroleum Co.

Mr. Strong testified he had been operating under a 5½-cent split marginal contract. He said that he had been invoiced at the contract price, plus 0.25-cent to be held in reserve by Socony-Vacuum to insure performance. He testified that it was his belief that Socony-Vacuum was splitting the reserve in the case of a broken price structure, or taking 0.125-cent to which it was not entitled. He was questioned closely on this point by Mr. Tappan.

Testifying that he had difficulty getting his Ethyl license cleared, Mr. Strong, in answer to a question by Mr. Tappan, admitted that the Ethyl Gasoline Corp. had made no inquiry from him as to the status of his supply contract. This, he indicated, was left to the supplying companies. Mr. Strong testified that he had been forced to accept Socony-Vacuum products after the termination date of the contract because his Ethyl license had not been cleared.

The F. & S. company operates in the heart of the central Michigan oil section. Mr. Strong told of his efforts to market a competitive Michigan low octane gasoline in an effort to retain volume. This, he said, was not allowed by his supplier. When Michigan gasoline was arbitrarily put into one of the F. & S. dealer stations the major company advertising signs were removed by Socony-Vacuum, he said.

Mr. Strong said other dealers in his territory marketed a competitive Michigan gasoline and at the same time sold a nationally advertised brand.

QUESTIONS regardng protection for the F. & S. company during a price war were asked by Mr. Tappan. Mr. Strong said that he had been assured he would be protected during the below-normal period. He said that the company was later allowed, retroactive to the time prices were reduced, the dealers' margin, plus 0.5-cent hauling charge, which, he said, represented a net loss to the F. & S. Oil Co.

When questioned by Mr. Tappan if, to his knowledge, there were any other similar arrangements made during that period, Mr. Strong replied that while he was not positive of specific instances, it was his understanding that other jobbers also were being protected by their sources of supply. Some, he indicated, were receiving more protection than his company.

The hearing is to be resumed Nov. 14.

Gasoline Tax Regulations Approved

By Teletype

WASHINGTON, Nov. 12.—Secretary of Treasury Morgenthau today signed the regulations covering changes made in administrative provisions of the federal gasoline and lubricating oil taxes which were embodied in the Gore amendment to the "Tax-the-Rich" law. The regulations will probably be released November 13. Most important of these changes, which became effective October 1, is a provision making tax-free all sales to any governmental agency.

Teagle Warns of Unsound Legislative Program

NEW YORK, Nov. 8.—Competition is the answer back of the United States' lead over the rest of the world in the enjoyment of the automobile, Walter C. Teagle, president of the Standard Oil Co. (New Jersey), said in a radio address last night in the program of the automobile show here.

Commenting on the fact that the price of gasoline to the public had been continually on the down grade since 1920 despite increased taxes which now amount to $1,046,000,000 yearly, Mr. Teagle said this was the result of competitive conditions within the industry. Both the industry itself and the public have benefited by these competitive conditions, he said.

However, proposals for new legislation have occurred within recent months which are unsound, Mr. Teagle continued, and would seriously interfere with the continuance of the development of this industry. "The gasoline consumer cannot continue to enjoy the advantages of the freest use of the motor car if the responsibility of management be taken away from the thousands of individual companies and concentrated in a federal bureau," Mr. Teagle said.

Other portions of the address stressed the progress made in the automobile industry and the part that the petroleum industry had in its development.

"Gas" Charged to Stations at Tank Car Prices, Wisconsin Hearing Shows

By E. L. Barringer
N. P. N. Staff Writer

MILWAUKEE, Nov. 7

THAT service stations of two major companies in Milwaukee received gasoline invoiced at or near the tank car delivered price was brought out at the second hearing here this week before the Wisconsin's markets department on petroleum fair trade practices and competition.

This explanation from one company on its method of charging gasoline to a station, coupled with other accounting practices, led the jobbers' attorney to charge at the hearing that the company's service station costs previously submitted were not within 75 to 100 per cent of being actual station costs.

The second hearing, Nov. 6 and 7, was more heated and produced more clashes between counsel for the independent jobbers and major companies than the first hearing Oct. 8 and 9 at Madison.

Charges were made that counsel for jobbers was conducting a "fishing expedition." Another charge was that no issue was before the department since no charges had been filed. One company attorney claimed that the inquiry was into private affairs of his company and asked that the hearing to be dismissed so his people could go home and attend to their work.

The fuse that lit the legal fireworks this week, as at the original hearing, was the refusal of W. L. Zust, president of the Cities Service Oil Co. of Wisconsin, to present data about his company's operations.

Attorneys participating in the subsequent debate included: R. M. Orchard, Madison, Wisconsin markets department; E. L. Wingert, Madison, Cities Service; W. R. Allen, Chicago, Sinclair Refining Co.; J. H. Marshutz, Milwaukee, Wadhams Oil Co.; and Fred M. Wylie, Milwaukee, Wisconsin Petroleum Association.

Among the points made by Attorney Wingert, in objecting to Mr. Zust being asked to produce marketing records were these:

That the department commission has no statutory authority to require production of documentary or oral evidence.

That no complaint was filed against Mr. Zust or the Cities Service company.

That the department has no jurisdiction in the proceedings and that sections 99.14 and 99.16 of Wisconsin statutes are unconstitutional.

That, even if it is proven that the department can compel testimony and documentary evidence, this should not be used openly for the information of competitors as it is information of a private nature. Attorneys for Sinclair and Wadhams joined in the objections.

During the debate which followed, Attorney Wylie contended that if he is on a fishing expedition, then he is angling where there are many fish. He contended also, that the major companies are paying no attention to costs and are interested only in gallonage to monopolize markets.

The markets department has no desire to embark on a fishing expedition, Attorney Orchard stated, but wants precise information. Purposes of the hearing were restated by Attorney Orchard as being an inquiry into methods of competition and trade practice, and into whether or not there is needless waste in petroleum marketing in Wisconsin tending to increase costs to the public.

Decision on Mr. Zust's objection to presenting data was that evidence need not be produced at the current hearing but that eventually the department would ask for definite information on marketing operations.

A similar objection had been raised by Mr. Zust at the original hearing Oct. 9, and determination of the issue then was set over to the current hearing.

The two companies offering testimony on charging gasoline to two stations at or near tank car delivered cost are Barnsdall Refineries and Wadhams.

Original records on two Wadhams stations in Milwaukee giving costs per gallon of marketing gasoline had been submitted* at the first hearing and explanations given on factors involved in determining such costs, but detailed questioning on these factors was not made until the current hearing. The stations are on W. Wisconsin

*National Petroleum News, Oct. 16, page 11.

Profit and Loss Statement, A Milwaukee Station of Barnsdall

(Exhibit at Wisconsin markets department hearing)

1935	Operating P. & L.	Deprec.	Final P. & L.	Gallons Mdse. Sold
Jan.	$ —442.52	$ 390.48	$ —833.00	9,235
Feb.	—484.36	391.46	—875.82	8,402
March	—206.67	391.46	—598.13	11,311
April	—263.86	391.62	—655.48	12,063
May	— 18.78	391.58	—410.36	14,106
June	41.16	391.04	—349.88	15,406
July	117.59	391.04	—273.45	17,037
	$ —1257.44	$2738.68	$ —3996.12	87,200

Investments

Land improvement	$ 870.00	Depreciation at 20 per cent annum. per
Building-operating	18,069.29	Deliveries started August 1934
Tanks & pipelines	917.71	Average payroll of employes, five.
Equipment	2,936.32	
Furn. and station supplies..	668.61	
Total	$23,461.93	

Ave., Milwaukee, one at 26th the other at 27th St.

Questioning of Wadhams executives this week on cost figures concerned data for the first eight months of 1935 on the 27th St. station. Major points under consideration were:

That gasoline was charged to the station at the tank car delivered price. The tank car price was determined by averaging costs on the company's tank car purchases for the month and the per gallon figure applied to deliveries during the month to the station.

That in arriving at gasoline cost figures gross profits of products other than gasoline were handled by subtracting them from the station's total expenses.

That items of general overhead expense, such as advertising and some insurance costs, were not charged back to the specific station.

Attorney Wylie asked whether the company charges dealers a higher price than is charged to company stations.

Attorney Orchard inquired if each line of merchandise should not carry its own share of cost. The Wadhams witness agreed to such cost division, if such costs could be allocated to the various lines.

Witnesses for Wadhams were R. P. Schwalback, secretary, and J. B. Wilbor, marketing statistician. Explanations offered for accounting methods used were that the figures were original records, such as Wadhams has kept for a number of years, and that the records provide the company with a basis for comparing costs at various company stations.

Attorney Wylie said that the data in question was not within 75 to 100 per cent of representing actual gasoline costs.

Testimony was given that, at a Barnsdall company station on E. Wisconsin Ave., Milwaukee, gasoline was charged at the tank car delivered price plus 0.5 cent a gallon for delivery. W. T. Hansen, Milwaukee manager, presented the cost figures for seven months of this year. Barnsdall has two company operated stations in Milwaukee.

M. C. Zuehlke, accountant in the Milwaukee office, testified that the tank car price is determined by the refinery, on a Group 3 freight basis. Also, that dealers are invoiced for gasoline at the retail price less the dealer margin.

Several major company managers were recalled to be questioned about their knowledge of how retail prices are determined. They said prices come from a higher office, and they do not know how retail prices and dealer and jobber margins are established.

WITNESSES who appeared Oct. 8 and again this week were F. C. Strum, The Texas Co.; John Budde, Standard Oil Co. of Indiana; R. G. Johnson, Phillips Petroleum Co.; and J. A. Sheridan, Shell Petroleum Corp. New witnesses questioned about price determination were J. C. Smith, Phillips bulk agent, Milwaukee, and J. F. DeBaufer, sales manager for Cities Service of Wisconsin.

Mr. Zust remained on the stand to answer general questions about his company after refusing detailed figures.

Mr. Zust said that Cities Service of Wisconsin is a marketing company, standing on its own feet. As head of the company he said he is an independent, and his own boss. The company buys gasoline on a contract with an Empire company, based on the low quotations of two price reporting publications, he testified.

Mr. Zust admitted there were too many outlets in Wisconsin, just as there are too many grocery stores, and that economic conditions will eventually remedy the situation.

When questioned about state income tax losses reported by his company for 1933 he replied, "I'd like to see some of the fellows who made money in 1933. I could learn something from them."

On jobber margins he stated, "Jobbers are not getting a 7-cent margin because, if they had it, they would not know what to do with it."

M. G. Peeters, Wadhams vice-president, also was recalled to the stand, and admitted that Standard of Indiana was the "market maker" and that it is necessary to have a market leader.

"It is refreshing to find one oil man who knows who fixes prices," Attorney Wylie commented.

Mr. Peeters said he has changed his mind about price sellers being market leaders, as they are not content with a price reduction, but continue reducing to keep below competitors' prices. Price sellers are professional price cutters, he charged.

When questioned about rising tank car and lower retail prices in Milwaukee this year he explained that tank car prices reflected a stronger crude oil situation, while local conditions reduced retail prices.

As for jobbers being squeezed on the fluctuations of these markets, he estimated that a majority of the jobbers were being helped by sources of supply to the extent that the jobber recovers the full dealer margin plus a 1 to 1.5-cent jobber margin.

W. T. Hansen, Milwaukee Barnsdall manager, made his first appearance on the stand this week. He lacked information on costs. He said he is given a gallonage quota, but refused to admit his sole job was to get rid of the gallonage. D. W. Gluck, Barnsdall assistant Milwaukee manager, testified also.

When pressed for an answer on questions about loaning of equipment Mr. Hansen replied, "We are not 100 per cent lily white."

In closing the hearing Attorney Wylie called on a Wadhams jobber and a dealer to get in the record the tank car and dealer tank wagon prices charged them on gasoline for each of the first eight months this year, as companion testimony to that of Wadhams charging the 27th St. station the tank car delivered price.

Fred Schultheiss, department commissioner, presiding, announced that the next hearing will be held Dec. 4 in Oshkosh.

Crude Reserves Appear More Adequate Today Than Ten Years Ago

By Axtell J. Byles*

PETROLEUM products are, next to food, clothing and shelter, the most essential commodities to present day society. It is therefore natural that the public should be profoundly interested in the question of the adequacy of supply.

During the past 20 years some 11 official surveys of petroleum reserves have been made. It is interesting to note that usually the later estimates have exceeded the earlier ones notwithstanding the ad interim withdrawals from underground storage.

In 1925 the Institute appointed a committee of eleven to make such a survey and its work was published in a volume entitled "American Petroleum—Supply and Demand." Now, a decade later, the conservatism and wisdom of that study are amazingly vindicated.

The Institute has considered it wise to bring the 1925 survey down to date, forecast the demand for the next 25 years, make another study of petroleum reserves, and broaden the scope of the original survey by adding chapters on transportation, refining, marketing, taxation and labor. A summary of the survey in the nature of a report from the executive committee to the board of directors is available in preliminary form for distribution at this meeting. It is expected that copies of the entire survey will be ready for distribution at a comparatively early date.

I desire to express appreciation to those gentlemen who have so generously contributed their time and their talent to this undertaking.

If it were a fact, as has been so frequently, vociferously and erroneously alleged, that our petroleum reserves will be exhausted, at the rate of present use, in eight, ten or twelve years, the public might be justified in taking drastic action to conserve them, perhaps even to the point of largely shutting in our own production and opening wide the gates to imports. That would certainly conserve American supplies. Happily, both for the public and the industry, no such need exists.

The 1925 survey indicated 5,321,000,000 barrels of crude oil in proven underground reserves capable of recovery by production methods then in use. The committee of eleven wisely pointed out, however, that there remained unexplored 1,105,454,459 acres in which the geological formation indicated oil might be found. It further pointed out that supplies as yet undiscovered would be found at much deeper levels under pools already producing, and elsewhere. It drew our attention to coal and oil shale deposits from which petroleum, or its derivatives, could be extracted to supply the nation's requirements for centuries to come.

Since the survey of 1925 we have produced and consumed 8,692,000,000 barrels of petroleum and today we have, according to informed and conservative estimates, 12,177,000,000 barrels in proven underground reserves recoverable by present methods of production. The industry, as predicted, has discovered vast reserves of crude oil at lower levels and is now finding production as deep as 11,000 feet as against 7500 feet at the time of the 1925 survey. Furthermore, it is capable of drilling to a depth of 15,000 feet, with present equipment.

It has learned to restore reservoir energy to old pools and maintain it in newer fields through controlled gas-oil ratios, to repressure with air or gas and to use a water drive, thus permitting the recovery of vast amounts of oil from the sands which, with the technique of even a decade ago, would have remained unrecoverable.

The present survey, referring to reserves contained in bituminous coal and oil-bearing shales, calls our attention to the fact that today in England and Germany gasoline is being produced from coal and lignites at a cost varying from 10 to 15 cents a gallon. A substantial amount of the motor fuel is now being so produced in those countries. These processes are relatively in their infancy. Can there be any doubt that with progress in the art, and increase in volume, production costs will be reduced?

This illustrates a fact proved by history, namely, that need and price will either produce the required quantity of any essential product, or will produce a substitute for it. Rapid advances in science suggest that the question may some day be not "How long will our supply of petroleum last," but rather "How can we use our supply of petroleum."

The importance of these facts, from a public interest standpoint, is, however, the absurdity and evil of loose statements, to the effect that our crude reserves are rapidly reaching the point of exhaustion. Such statements, though they are absurd,

*President, American Petroleum Institute.

A.P.I. Attitude on Code

There is no disposition on the part of the Institute to impose a code on the industry, President Byles announced in his annual address at Los Angeles.

"Unless a code can be evolved which will have practically unanimous support of the marketing branch of the industry, there should be no code," he said.

are not vicious if made as a result of misapprehension of the facts. They are vicious, however, if they are merely used for the purpose of frightening the people and their legislative representatives into federal control of this industry.

With a single exception or two, the great oil producing states have enacted conservation laws, encouraging scientific proration of production to prevent the waste of reservoir energy, aiding in voluntary unit operation of pools and in the recovery of the greatest amount of oil per acre at the least cost.

In certain pools the application of the acreage factor in proration constitutes a difficult problem. None will assert that because an owner holds less than the per well acreage, determined by the state authorities as proper for the pool, such owner should be deprived of his full pro rata share of the oil. On the other hand, equity and justice dictate that such an owner should not be permitted to take more than his pro rata share of the oil. In other words, take his neighbor's share. Recovery of the greatest amount of crude oil at the lowest cost is conservation in production. It serves both the public interest and the industry. The law of capture conflicts with such orderly, low-cost and high-yield production and consequently with the public interest.

That the producing states have authority under their police power to protect the public interest in this regard I have no more doubt than I have that they will, with the co-operation of the industry, find an equitable way to do it since they have overcome as perplexing problems in the past. Exchanges and consolidation of acreage to attain requisite drilling blocks should be made whenever possible. The state authorities are in a position to encourage this through their power to grant or refuse drilling permits and to act as friendly arbiters.

Congress, at its last session, exercising its exclusive jurisdiction over interstate commerce, passed a law interdicting shipments of petroleum produced in violation of state laws (the Connally Act—S.1190), thus supporting the states in their control of production, which is within their exclusive jurisdiction.

At the same session Congress also gave its consent to an interstate compact for the conservation of petroleum and natural gas entered into by six of the producing states. It is hoped that all of the remaining oil producing states will soon give their adherence to this compact.

Congress did not legislate upon the subject of imports. Its consideration might well be given to making permanent the Connally law (S.1190), which expires in 1937, and adding thereto a section providing for federal regulation of imports to some percentage of relationship to domestic production, so long as this may be necessary to effect the balancing of supply with consumption.

No Shortage in Sight

Proven crude reserves in 1925 were 5,321,000,000 barrels in the U. S. Since then 8,692,000,000 barrels of oil have been produced and known reserves now are larger than they were then.

With these observations A.P.I. President Byles suggests that the question may change from, "How long will our supply of petroleum last" to "How can we use our supply of petroleum."

The current survey, which gives careful consideration to the various items affecting demand, indicates that in 1950 we will require a daily crude oil production of 3,041,000 barrels, this demand declining by 1960 to 2,926,000 barrels per day. In the demand forecast every domestic requirement is provided for, including motor fuel, lubricants, fuel oil, and the multitudinous other products of petroleum. There seems no present reason to doubt that the industry wil be able to provide this production of natural crude oil over the period indicated and no one now knows for how many decades thereafter.

Should natural crude oil become not available in sufficient quantities, or at a competitive price, it would be gradually supplemented by production from bituminous coal and then, as we now foresee it, by production from oil-bearing shales. However, that time now seems more remote than it did a decade ago. Should that day come the motor fuel obtainable from coal alone would be measured in hundreds of billions of barrels while oil shales would yield an estimated potential production of 108,000,000,000 barrels of crude oil. The latter alone at the present rate of consumption would take care of our needs for a century.

The contribution toward conservation, by improved technique, in the producing branch of the business is difficult to measure in millions or billions of barrels, though the aggregate during recent years has been large and is ever increasing. The contribution of the refiner of crude oil toward conservation can be measured fairly accurately. By the cracking processes alone 6,660,747,000 barrels less crude oil have been required to serve the public over the past 15 years than would otherwise have been required. This is equal to 75 per cent of the total crude oil produced during the last ten years.

Cracking is the major contribution of the refining industry along this line, though it is but one of scores of practical contributions of these modern refineries which house the laboratories where magicians work.

One of these of recent development, though already in commercial operation, is known as polymerization. By means of it, gasoline is manufactured from refinery as well as natural gases without the use of crude oil.

Progress along these lines is constantly being made under the drive of competition and the free incentive of individual initiative and reward, which is the heart of the American system. A brief way to sum this up is to state that to have produced the 1934 domestic motor fuel requirements by refining processes used in 1917 would have required 1,909,000,000 barrels of crude oil. However, the industry actually met those requirements by refining 895,636,000 barrels of crude oil and sold a better quality of gasoline to the public at about half the price charged in 1917.

This is real, as contrasted with theoretical or bureaucratic, conservation. It is not the result of governmental compul-

sion but of economic and competitive urge, the rendering of a service with the hope of earning a profit. Economic incentive removed, initiative is destroyed, and drifting is substituted for progress.

It is unnecessary to describe to this audience the unique and low-cost transportation system which has been created by the petroleum industry to meet its peculiar needs. This includes 140,000 railroad tank cars which, together with package shipments, furnished about 10 per cent of the total tonnage freight revenue of our railroads; 130,000 motor trucks serving the consumer of petroleum products; 390 tank ships, which comprise about 20 per cent of America's entire merchant marine tonnage; coastwise and inland waterway tonnage; and 112,000 miles of pipelines, which are integrated refinery facilities. These could not have otherwise been built or continue long to operate. Speaking of pipelines, Professor Harold Rugg, of Columbia University, in his recent book, "An Introduction to American Civilization," says:

"This great pipeline system is called the 'underground railroad of the United States.' If all the petroleum which moves through these pipelines in a year were loaded in barrels or in oil tank cars to be hauled by railroad, it would make up a train 40,000 miles long, which would stretch once around the earth and two-thirds of the way around again. Yet this enormous tonnage is moved so quietly and invisibly under the ground that most people know nothing about it."

Pipeline rates are under the jurisdiction of the Interstate Commerce Commission and state public service bodies. It is interesting to note that during the 29 years the pipelines have been under the jurisdiction of the Interstate Commerce Commission but two complaints have been filed against any phase of their operations. One in 1921, when tariff rates and minimum tenders from the Mid-Continent area to Pennsylvania were attacked. The other, in 1934, when a protest was made against reductions in rates voluntarily established by certain pipelines. This protest came from a group of non-integrated refiners who felt that their competitive position in the markets would be prejudiced by the lower rates.

It tempts one, in view of the suggestions made from time to time that pipelines be divorced from refining operations, to inquire as to just who would be benefited by such action. Would it be the producer of crude oil, who now finds a market for his oil at his well? Would it benefit the owners of the tens of thousands of stripper wells where gathering costs are high and frequently service is rendered at a loss to the pipelines? Would it be to the interest of the non-integrated refiner, where changes in pipeline tariffs may enlarge the marketing area of his urban integrated competitor? Would it be to the interest of the public, when higher pipeline rates and increased cost would inevitably become necessary to enlist capital for the construction and maintenance of non-integrated lines to new fields without assurance of a supply at one end or a market at the other?

THE marketing chapter of the survey will show an amazing service anticipating the needs of our motor vehicles, which increased in number from 8000 in 1900 to nearly 26,000,000 in 1935, by supplying an estimated total of 80,000 barrels of gasoline in 1900, 79,949,000 barrels in 1918, 232,745,000 barrels in 1925, and 410,339,000 barrels, or 17,234,000,000 gallons, in 1934. During this period gasoline changed from a by-product to a luxury, and then to an every-day necessity. This growth raised problems more rapidly than they could be solved. There has been, nevertheless, a constant improvement in quality and service and a lowering of prices.

Undoubtedly, the distribution of products presents in all industries one of their most perplexing problems. The petroleum industry, in common with others, is faced with difficulties in marketing which are challenging. Because we are so close to these problems, we undoubtedly feel that they are more serious than those of other industries. Perhaps they are. One thing is certain they must, and can only, be solved by the industry operating under normal economic laws, for we can no more avoid these fundamentals, without serious consequences, than we can the law of gravitation.

There is not a moment of the day or night when the law of diminishing returns is not working. Each additional filling station means less gallons per pump for existing stations. Fortunately, while retail outlets continue to be established, the pace is decelerating.

Concomitant with occasional suggestions for the divorcement of pipelines are suggestions for the divorcement of retail marketing from refining operations. It is as violent an assumption to state that a manufacturer can be deprived of his legal right to sell his product at retail as it would be to state that he can be deprived of his legal right to sell his product at wholesale. It is easily conceivable, however, that should the present margin policy and imposition of penalty chain store taxes on filling stations continue, segregation of retail marketing from refining would come about.

This possibility raises several interesting questions. Suppose retail marketing were segregated from refining, what then would be the situation? Gasoline would be supplied to the retail marketers by those refiners who could deliver the best product at the lowest cost. There would be no margins. There would remain no so-called "leaders" who would set prices for their own products to be undersold by their competitors. In fact, the supplier would have no competitors so far as retail marketing is concerned as he would leave that field of combat to a purely retail merchandising trade and the business would be conducted as any other retail trade, such as boots and shoes, meat and clothing, and both the law of diminishing return and the law of survival of the fittest would prevail in this, as in other retail marketing.

There remarks are not to be construed as a recommendation to any one or a prophecy but rather as a conjecture as to what would occur if present trends continue. Should this

conjecture prove to be correct, we would then learn how many unneeded retail outlets there are and, in the long run, and it probably would not be very long, the answer to this question would become apparent through the lessening of uneconomic outlets.

Should such an eventuality occur, the motoring public would not suffer. The real merchandiser, as distinguished from the tonnage mover, would survive and in this, as in similar situations, order would finally come out of chaos.

The institute's vice-president for marketing is going to discuss with you the draft of a marketing code upon which he has been conferring with the industry for several months. He hopes to present this code to the Federal Trade Commission for its approval.

Desirable and helpful as would be a simple set of rules, such as this code contains, interdicting certain unfair marketing practices, I wish to state that—

(1) There is no disposition on the part of the institute to impose a code;

(2) Unless a code can be evolved which will have the practically unanimous adherence and wholehearted support of the marketing branch of the industry, there should be no code.

In some quarters skepticism is expressed as to the value of the Interstate Compact to conserve oil and gas. This, upon the theory that it is a co-operative and not a mandatory movement. The answer seems to be, first, that there is no power under the federal constitution for the federal government to control the production of oil, which is mining, any more than the refining of oil, which is manufacturing. That power is reserved to the states.

The compact is the democratic, as distinguished from bureaucratic—the economic, as distinguished from the political—way of solving our problem. If conference between the petroleum producing states, which are in close touch with their local conditions and advised as to the national requirements, cannot handle this situation, democracy fails. Inherent in the plan are the "potentialities for regularizing the industry without regimenting it; for assuring conservation without destroying competition; for protecting initiative and enterprise; for ending the demoralizing alternation of flood and drought; and for insuring the fullest possible recovery from our reserve of petroleum."

Governor Landon is quoted recently to have said "The oil industry in the oil-producing states has an opportunity for co-operation under the interstate compact which never before existed. Taking full advantage of this opportunity and sincerely co-operating, one with the other, to solve the problems of the petroleum industry, will assure this business of self-government and the elimination of any form of federal bureaucratic control."

Prophets Without Honor

The prophets of disaster have been confounded in recent months, President Byles told the A.P.I. in his annual address. The oil industry has not dropped into chaos because the NIRA was found unconstitutional. Instead "the statistical position of the industry has not only continued strong but has improved," he said.

The compact commission can aid in the improvement of the proration practices which have been worked out over a period of years, by the industry in co-operation with the state governments. An important objective of proration is conservation of reservoir energy, in the misuse of which almost alone any physical waste incident to the production of oil exists.

California has made remarkable progress toward the liquidation of surplus inventories during the past year. While expressing our appreciation of the hospitality of this great and attractive state, may we not express the hope that its legislature and its petroleum industry will unite in finding, by the enactment of a sound conservation measure, a permanent solution of its problem of over-production of crude oil. There is no section of the country which, from the standpoint of both the public and the industry, would derive greater benefit from proper conservation of this priceless heritage. May we not also express the hope that California, upon the enactment of a conservation measure, will become a party to the Interstate Compact, thus co-operating with her sister oil-producing states in serving national as well as local interests.

Notwithstanding the predictions of the prophets of disaster, when the Supreme Court declared the National Industrial Recovery Act to be unconstitutional, the statistical position of the industry has not only continued strong but has improved. Here is an evidence of industrial self-government, supported by fine co-operation from the conservation authorities in the majority of the producing states. It is encumbent upon these authorities and upon the industry to see to it that this improvement continues.

Refiners are apparently studying the forecasts furnished by the Bureau of Mines. The interstate compact is setting up its own fact-finding body and the Institute will, in addition to its other statistical service, continue, so long as there seems to be need for it, to publish in its Quarterly a statistical review similar to that published in pamphlet form on August 12.

With this data before it, the producing and refining branches of the industry will well serve both the public and themselves by governing their operations according to economic needs, with full weight given to seasonal requirements.

The demand for gasoline during the first nine months of this year has averaged about six per cent above the like period of 1934. Inventories of finished and unfinished gasoline at the end of September are estimated to have been 50,500,000 barrels, compared with estimated economic requirements of 51,110,000. These inventories totaled 53,160,000 barrels a year ago.

Crude oil inventories September 30, 1935, were approximately 320,000,000 compared with 349,407,000 barrels a year ago, indicating satisfactory progress toward liquidation of surplus crude. These figures compare with the 313,244,000 barrels in storage as of Novem-

ber 30, 1926, the lowest point established in recent years.

The price of 63-70 octane Oklahoma gasoline was quoted at 5.625-5.75 cents per gallon f.o.b. refineries on October 14. A year ago middle bracket gasoline was selling at Oklahoma refineries at from 4.125 to 4.625 cents.

The price of 36° Mid-Continent crude oil continues at $1 per barrel where it has remained since attaining that quotation on Sept. 29, 1933.

There are now pending in Congress bills which, if enacted, would mean the end, or at least the beginning of the end of the petroleum business as a private industry. In addition to those bills dealing exclusively with petroleum, your attention is drawn to the Mahoney Bill (S.3363)—now in the Senate Committee on Interstate Commerce. This is, in many ways, the most startling bill introduced in the present Congress. It provides for a federal licensing system for all business engaged in interstate commerce, ignores state lines, and practically every power reserved to the several states under the Federal Constitution, and every liberty of the individual citizen, placing supreme authority over all of them in a commission at Washington. This bill deserves the very serious consideration and active attention of all of our citizens, regardless of their business or vocation.

It is a matter of profound regret that the pending Cole Bill (H. R. 9053) contains a section which would create a federal board supervising the industry in an advisory way. The reason that this is objectionable is obvious. With such a federal board created, each conflicting interest in this vast and highly competitive industry would be appealing for relief. It is not within human probability that such appeals would not sooner or later result in a request by the board for legislative authority to take mandatory action.

One such act would inevitably require others and, provided such legislation were constitutional (which in most cases we believe it would not be) the industry would soon be regimented, managed and controlled by a political bureaucracy in Washington. This, in my opinion, would as surely follow as federal control of crude oil production, provided for in the pending Thomas Bill (S. 2027) —assuming but not admitting its constitutionality—would inevitably lead to attempted control of refining and marketing.

AS THE months pass, it is becoming clearer to the industry that one cannot have his cake and eat it. Beyond the exercise of the police power of the several states over the conservation of crude oil and natural gas, government should not and cannot go unless it regiments and attempts to operate the whole industry by a board or bureau in the national capitol. Any one with the slightest practical experience in this, or any other, great business, knows that such procedure would bring ruin to all concerned and the public should be shown its vital interest in the matter. We will either have a competitive, private industry to serve the public or we will have a socialized industry to serve the political bread line.

Regardless of the different economic situations of individuals and companies within the petroleum industry, and regardless of the differences of opinion, by reason thereof, which exist as to internal policies, I believe it can be stated, without fear of contradiction, that on this question of federal control the industry is united against it almost to a man. There should be no breach in the wall, no over-confidence, no failure to guide our every act from the standpoint of the public welfare.

We know a good many things about this industry that the public does not but should know. The public, particularly within the past two or three years, has been given much misinformation concerning the industry. The public and its representatives in Congress should know that throughout three quarters of a century the industry has never faltered in supplying an abundance of the multitude of essential petroleum products, of steadily improving quality at steadily reduced prices. They should understand that so far ahead as the mind of man can run there is no possibility of a failure of this supply. That long after those of us now living have rested from our labors, the time may come when the practically endless reserves contained in bituminous coal and oil shales may be called upon to supplement natural crude oil production. No student of this subject believes for a moment that when that time comes such supplies will not be forthcoming at prices which will permit their fullest use.

This industry is made up of human beings. Neither it, nor any of them, are perfect. Measured in terms of national service in good times and in bad, it need have no embarrassment in a comparison of its record of service to the public with that of any other group or industry. Perhaps we may be permitted to call attention to the fact that during the depression this industry has not been a suppliant for federal relief.

On the contrary, it has contributed at the rate of over a billion dollars a year in the form of taxes to the support of government, which equals 11% of all federal, state and local tax receipts. It increased employment 37% from the depression low point, at the same time shortening working hours 30% and raising the wages of its employes. These wages, in purchasing power, stand today at practically the 1929 peak. Has Government itself made a comparable record in administering its own affairs? Does the history of any government in any business lead us to believe that it would improve upon this record? Why single out the oil industry for federal control?

Important as is the oil industry to those engaged in it, America itself is infinitely more important. The sole measure of permanent recovery is private re-employment. Employment given by government is not recovery. It is relief. It is the duty of this industry to continue to maintain its high rate of employment, its liberal wage scale, and good working conditions, and to be thoughtful and

conservative in its operations, keeping them within sound economic requirements in order that it may continue to render the maximum service to the nation. This it can and will do unless the Federal Government prevents it.

Oil Compact is Functioning

Marland Tells A. P. I.

LOS ANGELES, Nov. 11

THE Interstate Oil Compact is organized and functioning although it was approved by Congress only on August 27, 1935, E. W. Marland, governor of Oklahoma and chairman of the Interstate Oil Compact Commission, was to tell the institute, in a prepared address, at its general session here Nov. 13.

Governor Marland was not able to make the trip to Los Angeles himself because of the press of his duties in Oklahoma. He sent as his representative Tom Anglin, Oklahoma's representative on the Interstate Compact Commission. Mr. Anglin was to read the paper prepared by the governor.

Since its ratification, the compacting states have stayed within the allocation fixed by the best authorities on market demand, his address stated, while most of the oil producing states outside the compact have not stayed within these allocations.

Gov. Marland described the compact as a great step towards co-operation and understanding between states which sometimes have had divergent policies. His address concluded:

"If the compact is to survive, if the industry is to continue to improve, if conservation of these natural resources is to become a reality, then all major oil producing states must become parties to this agreement, must co-operate in a fixed and definite way and must not pursue uncharted independent courses."

Gov. Marland told of the history of the movement which led to the interstate oil compact and described the forming of the Colorado River Compact, which had for its main purpose the building of Boulder Dam, as a similar movement. The states of Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming participated in this compact.

He stated there was greater need for co-operation among oil producing states now than in the past, because of the improvement in producing and refining methods, which allow crude oil, from depths up to 10,000 feet, to be taken from the ground quickly and turned into gasoline. "Any large pool in any state can wreck the market and start that pool and other producing states upon an orgy of waste of our natural resources," he stated.

"It is my idea that the compact commission should, from time to time, estimate the production from each state which may, within a certain period, be produced without waste—and supply these estimates to the producing states for their consideration," his address stated.

"As long as any one state taken unto itself the absolute determination of the amount that state should produce without reference to the nation as a whole, and in disregard of the rights of the other oil and gas producing states, then just that long we are going to have a disorganized and wasteful condition in this industry.

"One state cannot determine this question alone, and if one state should do it, then they all can, and will, do so—thus causing the wasteful production of our natural resources sought to be prevented by this compact."

Gov. Marland's remarks stated that seven states in the U. S. produce more than 95 per cent of the oil and gas of the nation, and 41 states produce little or no oil. He said it was necessary that the non producing states recognize the conservation problem which the oil states are attacking through the interstate oil compact. The states which have ratified the compact are Colorado, Illinois, Kansas, New Mexico, Oklahoma and Texas.

This is one of the very few meetings of the Institue which Governor Marland has missed since it was organized. He was a director of the Institute when actively engaged in the oil business.

Big Companies to Drill In United Kingdom

LONDON, Oct. 30.—The great oil distribution concerns operating in the United Kingdom have made more than 50 applications for licenses to drill for oil in the British Isles. Those already granted are expected to be announced by the Petroleum Department of the Board of Trade in the near future.

The big oil companies have set aside £3,500,000 ($17,500,000) to prospect for oil in the United Kingdom. They are prepared to sink wells that cost $20 per foot. Further, they are prepared to drill to an average depth of more than 5000 feet in Derbyshire—the site of Britain's first productive field—and in Sussex and Kent counties.

The Anglo-Iranian—formerly Anglo-Persian—Oil Co. has brought back from its Persian fields several expert drillers and engineers to supervise the new work. The Government is very interested in the Anglo-Iranian's proposed prospecting operations—it holds £7,500,000 of the company's £13,500,000 ordinary shares.

The first well sunk in England—at Chesterfield, Derbyshire—was more than 3000 feet deep. It was sunk as a war measure, when imported supplies were scarce. It produced two tons per day, then dwindled to a steady 40 tons per month. It is still producing, but it requires deepening.

Mistakes in Automobile Design are Costly Both to Public and Oil Industry

LOS ANGELES, Nov. 9

ERRORS of commission and errors of omission on the part of the automobile designers are costing the oil industry large sums by requiring unnecessary changes in refinery technique and are limiting the enjoyment of cars by the motorist.

This was in substance the report of the Automotive Survey Committee of the American Petroleum Institute, which was to be presented at the meeting here of the institute by A. Ludlow Clayden, of Sun Oil Co., Philadelphia.

The committee was created at the 1935 summer meeting of the institute, to study changes in automotive design from the viewpoint of effect on the manufacture and distribution of petroleum products.

The committee report points out a very distinct difference in the viewpoint of the automotive and the oil industry and states it is doubtful if the automobile industry realizes the difference.

"In automobile production rapid changes are desirable because they stimulate obsolescence," states the report. "In petroleum products they are undesirable because they tend towards increased refinery costs and consequent price increases to the motorist."

Commenting on the failure of the automotive engineers to redesign the fuel systems to allow the use of more volatile motor fuels, after research work largely financed by the oil industry had shown the mechanical faults which were increasing temperatures in the fuel system, the report states:

"History has shown that the automobile industry can adopt improvements very rapidly when they are proved to be improvements. Why it refuses to act in this instance remains an unsolved mystery.

"There is every reason to anticipate that the next several years will be a period of very high production of new cars, because the decrease in buying during the depression has created an exceptionally large replacement market. Estimates of production for 1936, at the time of writing this report, are between five million and six million cars.

"If these cars, and those to be produced in 1937, are not all of them much better than cars of 1934 and 1935, then the day when we can provide the public with easier starting, better accelerating, and more economical motor fuel is unduly postponed —and the car owner is the principal sufferer."

Just after the war there was a sharp drop in motor fuel volatility, due to a scarcity of crude. Motor car manufacturers changed their carburetors and built cars which worked satisfactorily. Since then crude and light products have become more plentiful but all car manufacturers have not changed their design to utilize more volatile fuel, the committee points out.

It was about four years ago that the importance of cool fuel lines was first made evident. Much improvement was made in the "plumbing" then but what was gained by relocation of fuel lines now is being lost because the body design engineers have fitted hoods down more closely over engines and reduced the size of radiators. Temperatures have risen under the hood so that gasoline now boils in the carburetor bowl instead of in the pump.

Although the committee sees some faint beginnings of progress in certain 1936 models it reports that is "very disheartening that we are still hardly any better off after three years of effort to persuade engineers how they are acting against their own best interests and against those of their customers."

Of course, it is only a few of the cars that are bad offenders. only 22 per cent of all cars in service are keeping the remaining 78 per cent from having a fuel which would give better starting and acceleration, would improve anti-knock qualities and permit a substantial saving in refining expense.

The committee reported that one oil company found that 60 per cent of 1934 cars would handle gasoline with a vapor pressure up to 11 pounds; 6.6 per cent up to 9 pounds; 6.8 per cent up to 8.5 pounds; 1.5 per cent up to 7.5 pounds and 5.2 per cent only up to 7 pounds.

One of the first steps of the Automotive Survey Committee was to make a study of the cars registered on Dec. 31, 1934. It will be surprising to most persons that the committee found that the average car is five years old; that there are more Model T than V8 Fords on the road, with Model A outnumbering them both.

Of each 100 cars registered

Trend in Cars Requiring Extreme-Pressure Lubes

The trend in the number of cars built requiring extreme-pressure lubricants was shown as follows in the report of the Automotive Survey Committee:

Year	Cars Produced
1930	57,205
1931	155,330
1932	73,350
1933	86,950
1934	812,812
	1,185,647

"It should be remarked that the low figures for 1932 and 1933 do not represent any decrease in the makes for which extreme-pressure lubricant was recommended but for greatly reduced production of the makes calling for such a lubricant."

Dec. 31, 1934:

13 were built in 1934
9 were built in 1933
6 were built in 1932
10 were built in 1931
12 were built in 1930
16 were built in 1929
11 were built in 1928
7 were built in 1927
6 were built in 1926
4 were built in 1925
6 were built before 1925

This explains why not more than 30 per cent of the cars on the road at the end of 1935 will require a higher octane gasoline than 65; that not more than 15 per cent of the cars needed more than 65 octane gasoline two years ago when 68-70 became a sort of unofficial standard for regular gasoline.

The committee stated in its report that the oil industry has gone to enormous expense to help the automobile builder make old cars obsolete, since only 15 per cent of the cars needed such a high anti-knock fuel as 68-70 when it was brought out. By the most optimistic forecast half of the cars will not need such good gasoline before the end of 1936, it was stated.

Mr. Clayden warned the automobile industry in reading the committee's report that advances in octane rating above 70 will be costly—in effect that it is time to slow down in octane requirements.

Until recently the average car has not been very sensitive to motor oils. No cars required special oils as high compression cars demand special fuel.

With new bearing metals a new situation has arisen within the past two years, the committee reported. With these new metals some oils made to resist oxidation and considered of the highest quality appear to be unsuitable.

"This situation has been well known for over a year," the committee reported.

"It was precipitated by just one make of car which started to employ these bearings in its 1935 model. Oil temperatures in this car rise to exceptional heights, and it has been amply proved that bearing corrosion will not occur with these new metals if oil temperatures are restrained to reasonable maximum—say, 250° F. It is positively dismaying to find the 1936 model of this same car only very slightly improved.

"How bad this situation is can hardly be believed by anyone not familiar with the case. For instance, 500 miles of fairly-high-speed driving, using some oils regarded as nearly ideal for all other cars, is sufficient completely to destroy a set of connecting-rod bearings. Oils exist which do not react corrosively with these bearings; but, with a few possible exceptions, they are not types desired by all other car manufacturers and by automobile users.

"Similar bearings are being used by other makers with great success—apparently because in these other cars oil temperatures are reasonable. Yet the petroleum industry has heard stated the suggestion that all motor oils should be changed to permit this one car to continue to use exactly the type of design it has at the moment. This make of car represents substantially less than 4 per cent of the cars on the road, including all its models both old and new.

"There is only one proper attitude for the oil industry to take, which is that bearing troubles in this car are due to faulty engineering. The less we are willing to help out the situtation, the more quickly will it be cured. The motor oils today recognized as high-quality products are enormously better than the motor oils of 10 years ago. Engines should be designed to take advantage of their qualities, just as modern designs take advantage of new qualities in gasoline.

"There is good reason to believe that the new bearings, when suitably employed, are a distinct improvement in that the rate of wear is reduced considerably. There is plenty of evidence to show that the corrosion does not occur if oil temperatures are prevented from rising very high. Consequently, while our knowledge on this subject is inexact, it does appear that the difficulty is overcome when oil temperatures do not exceed a maximum of perhaps 250° F.

"Right here we run against the same difficulty that occurs in volatility limitations, viz., that the temperature of the atmosphere surrounding the engine has increased a great deal. The confined space makes the introduction of an efficient oil cooler a major problem—and, of course, the cost of an oil cooler will always be a consideration.

"This is an engineering problem entirely. It has frequently been said, and said with truth, that the average motor oil is a great deal better than the average engine. By which is meant that modifications in engine design that would reduce oil temperature and lessen some minor forms of contamination could do far more to prolong oil life than any conceivable thing that could be done to lubricants. There is good reason to believe that the engineers will solve this problem mechanically fairly soon, especially since some of them appear to have done so already."

A new attitude on the part of the oil industry was suggested by the committee. Instead of testing oils and fuels to see how they work in automobiles it is suggested that cars be tested to see how they work with oils and gasoline.

It was in tests along this line —at Uniontown for example— that a great deal has been

Fall of Free-Wheeling

The rise and fall of roller-clutch free wheeling in automobile design was shown by the institute's Automotive Survey Committee through its presenting the accompanying table showing per cent of cars manufactured with free wheeling from 1931 to 1935.

The oil industry was forced to provide a series of special lubricants for this purpose, the committee's report brings out. However, improvements in free-wheeling mechanism in the first two years demonstrated that special lubricants were not necessary. "It is impossible to estimate the financial loss which the petroleum industry suffered through this temporary mechanical development," the report stated.

Cars Equipped with Free Wheeling

Year	Total	Per Cent
1931	407,590	21
1932	401,050	37
1933	495,650	33
1934	600,310	32
*1935	133,000	5

* Estimated.

learned about octane sensitivity, it was shown. Much was learned about cylinder head shape and spark plug location by such tests.

Suggestion was made that there be organized testing of cars by the industry, results being made available to the automotive industry. On this point the committee stated:

"The laboratories of the oil industry are the places where new cars should be tested and evaluated for characteristics that affect their petroleum-product requirements. This is because in these laboratories we find the suitable viewpoint. The automobile engineers would certainly welcome such testing if it were conducted in a systematic manner.

"From the large amount of data turned in by the members of this committee, it is obvious that nearly every laboratory has been using cars to test products. We want to reverse this procedure, and use products to test cars. For example, we find a certain car will have vapor lock if given fuel above a certain vapor pressure. But this is only the first step—and in studying the car, we should then find out the reason for the limitation and, if possible, what modifications in design would effect an improvement."

California University Investigates Gasoline Engine Variables

AN EXTENSIVE investigation into the relation between independent and dependent variables in internal combustion engines is being conducted by the department of mechanical engineering of the University of California. A report on results thus far obtained was made before the annual meeting of the American Petroleum Institute at Los Angeles by C. J. Vogt of the university. To get satisfactory correlation of data it has been found necessary to use the same equipment on all tests.

Results so far obtained indicate that the friction horsepower increases at a decreasing rate as the compression ratio is increased, that with the use of light crankcase oil partial lubrication is evidenced. It is found that the volumetric efficiency decreases with increased compression ratio, spark advance, fuel-air-mixture ratios approaching those for complete combustion, and is a function of valve timing.

The university's investigations have included a study of gaseous fuels. Butane as a motor fuel shows many advantages over liquid fuels, it was determined. The homogeneous mixture obtainable with a gaseous fuel increases the economy in multi-cylinder engines through the more uniform mixture distribution to the individual cylinders, particularly when the engine is operating relatively cold at normal atmospheric temperatures, Mr. Vogt stated. For most economical utilization of the fuel it is important to adjust accurately the carburetor and spark settings in order that maximum economy at the part-throttle settings for average operation may be obtained.

The laboratory equipment was described and illustrated in the paper and it was stated that all tests have been scheduled in such a manner that all but one of the independent variables are accurately controlled. The independent variables are compression ratio, throttle position, cooling-water temperature, mixture, ratio, mixture temperature, spark setting, and engine speed.

The fact that friction mean effective pressure has a decreasing rate of change with increase in compression ratio was explained as a phenomenon of lubrication and reaction between the cylinder wall and piston.

Various conclusions were drawn from work with butane-air mixtures. One was that the economy of gasoline-air mixtures was higher at the same compression ratio than when operating with butane-air mixtures. These results are not found in equipment on the road, it was indicated, where better economy is always claimed for butane. This contradiction was said to be evident if the difference in homogeneity between a gaseous mixture and an air-vapor mixture is considered. The more homogeneous mixture which obtains when operating with butane permits more uniform distribution of mixtures in different cylinders of multi-cylinder engines, thus dividing the load developed more equally. It is obvious that, with such results, gaseous fuels can show an advantage over liquid fuels, it was indicated.

The output of the engine was found to be higher for the same conditions of operation when operating with butane-air mixtures than when operating with gasoline-air mixtures. These results were attributed to the difference in carburetors required for the different fuels—the venturi required for gasoline being smaller at the throat than the venturi required for gaseous fuels.

It was concluded from these investigations that the spark intensity within the test limits imposed did not increase or decrease the power developed after the engine was warmed. Curves were shown which indicated that the leanest mixture possible for good running conditions will not necessarily yield the highest economy, and that carburetors compensated to give constant mixture ratios under all conditions of operation do not yield the best economy of the engine.

Embargo Not Proposed

WASHINGTON, Nov. 4.—Commenting on press dispatches from Geneva stating that the League of Nations' economic sub-committee has approved in principle a proposal to place an embargo on shipments of oil, coal, steel, and iron to Italy and intends to sound out Berlin and Washington on the matter, Acting Secretary of State Phillips today said he has no official information of such action.

Chief Saving in Automotive Diesel Operation is in Cost of Fuel

Presented before Sixteenth Annual Meeting, American Petroleum Institute, Los Angeles, Nov. 11-14. Original title of the paper was "Automotive Diesel Costs."

By C. G. Anthony*

THE ultimate goal of all transportation policy is to furnish the people the transportation service which they require in the cheapest and most efficient manner possible.

This principle is, of course, derived from the economic premise that, in the long run, the wealth of society depends upon the efficiency with which natural resources, labor, and capital are utilized—whether in the production of foodstuffs and raw materials, in manufacturing processes, or in the rendering of transportation services. When we have cheap transportation, we have one of the vital elements of prosperity, because prosperity is the condition that exists when there is a profusion of goods widely distributed among the populace.

Where can the high-speed automotive diesel engine further the effect of this economic principle? Through this agency, can cheap transportation be furnished the people? What are the costs of operating this equipment, and how do they compare to the costs of operation of the gasoline-motored equipment? Does the automotive diesel have inherent advantages over the gasoline motor; and, if so, what are they?

These are the questions that must be answered before the economic value of this type of diesel engine can be ascertained.

Due to the lack of proper data and cumulative experience, little material of real value has been published on the subject. The manufacturers of the automotive diesel are rather lavish in their claims for their products, and the owner and operator of diesel equipment speaks of remarkable performance and great economy of operation—often without adequate information upon which to base a sound conclusion.

The purpose of this paper is to develop conclusions from adequate known facts. Without such facts, conclusions are mere guess work—and guess work is the apex of uselessness.

In order to gather and tabulate sufficient data from which to formulate direct answers to the questions propounded above, a careful audit and study were made of the operating experience of Pacific Freight Lines, probably the largest trucking concern operating any appreciable quantity of diesel-powered equipment in the United States. Pacific Freight Lines operates throughout the territory lying between Fresno, Calif., on the north and the Mexican border on the south—with an extensive operation, in addition thereto, between Los Angeles and Arizona points. In this territory, there is a wide variation in operating conditions. In the main, the operations are all over primary highways, but numerous grades are encountered—and temperature conditions range from the intense heat of the Mojave Desert and Imperial Valley to the moderate temperatures encountered in the operations between the cities lying along the Pacific Ocean, between San Luis Obispo and San Diego.

The main fleet of Pacific Freight Lines consists of 75 trucks equipped with diesel motors, and several hundred equipped with gasoline motors. From this large fleet it was possible to pick for this study 20 Sterling trucks, of the same design, operating under the same conditions, same gross-weight load factor, and in the same territory. They were all FC-135 models, having three axles, ten tires, chain drives, auxiliary transmissions, and equipped with air brakes. Ten of the trucks were powered by Cummins diesel six-cylinder motors; the remaining ten were equipped with Waukesha, model "AB," gasoline motors. Each of the 20 trucks pulled, at all times, a six-wheel trailer; and under loaded conditions, the total gross weight of truck and trailer was 68,000 lb. The equipment at times was operated fully loaded, partially loaded, and in some cases empty; but all trucks and trailers were operated with an average gross-weight load factor of 70 per cent, or 47,600 lb.

A study of the operating costs of these 20 pieces of equipment developed the fact that a few of the costs entering into the operation of both the gasoline and diesel equipment were equal in each case—such as license fees, weight fees, taxes, storage, driver's wages, and public-liability and property-damage insurance. These costs were, therefore, eliminated from the study. The remaining operating costs, viz., fuel, lubricants, maintenance, depreciation, interest on investment, and fire and theft insurance—not being the same for the two types of

*Pacific Freight Lines, Los Angeles, Calif.

equipment — were carefully analyzed and compared.

A study was made of the ten diesel trucks, for the first four months of 1934, covering gallons of fuel used and its cost, gallons of oil used and its cost, cost of repairs, parts and labor, and the miles operated. These cost figures, and the basic units developed therefrom, are itemized in Table 1.

The same study was made for the identical equipment for the first four months of 1935, and the data and basic units developed are itemized in Table 2.

A similar study was made for the ten gasoline-equipped trucks, for the first four months of 1934, and the cost data and basic units are recorded in Table 3. No study was made of this equipment for the first four months of 1935, for the reason that prior to 1935 the gasoline motors had all been replaced with diesel motors.

The gasoline used in the trucks was the typical second-structure West Coast gasoline of approximately 70 octane number. The diesel fuel was typical of Los Angeles Basin crude production, and had the following general characteristics:

Diesel Fuel

API gravity at 60°F.	30-32
Viscosity, S. U., at 100°F.	40-43
Distillation range, °F	420-760
Cetene number	50-55
Diesel-index number	40-48
Conradson carbon residue, %	0.50-0.10
Sulfur, %	0.5 -0.7

Under the present conditions of distribution Pacific Freight Lines has found it necessary to centrifuge all diesel fuel before putting it into the delivery tanks. Such materials as tank scale, dust, asphaltic particles, etc., must be removed before going to the engine-fuel system, because otherwise clogging of the filters occurs and causes damage to the finely-fitted parts such as the fuel pump, injection nozzles, etc. This latter problem of maintenance of a clean fuel, up to the time of delivery to the consumer, is one that is being studied by the various oil companies; since it eventually must be solved, just as in the case of gasoline distribution. The higher viscosity of the diesel fuel makes clarification somewhat more difficult, but no doubt the problem can be successfully overcome.

The basic units developed from Tables 1, 2, and 3 have been recapitulated (for ease of comparison) in Table 4, and in this table depreciation, interest on investment, and insurance have been included.

In Table 5 the cost units which were listed in Table 4, on a cost-per-mile basis, have been expanded to a cost-per-million truck miles, as it is much easier to visualize the comparison of cost of operation between the two types of equipment, on a dollar-and-cents basis, magnified a million times, than it is to deal with the cost-per-mile units itemized in Table 4. As Tables 4 and 5 are essentially a recapitulation of the data contained in Tables 1, 2, and 3, all remarks and conclusions will be directed to and drawn from the data contained in the last two tables.

The facts developed by the data contained in Table 4 can be listed as follows:

1. A diesel motor runs between 60 and 65 per cent fur-

TABLE 1

Diesel Fuel Used, Lubricating Oil Consumed, Miles Operated—and Cost of Fuel, Oil, and Maintenance for First Four Months of 1934 and for Reference Designated as:

Group A-34

Truck No.	Fuel Used Gallons	Fuel Used Cost	Oil Used Gallons	Oil Used Cost	Repairs, Parts, and Labor Cost	Miles Operated
152*	2,599	$74.20	89	$39.20	$462.54	13,985
174*	4,206	118.53	172½	76.54	677.60	25,503
282*	4,159	116.97	171½	76.73	517.28	22,151
284*	3,750	106.00	170¼	75.32	585.59	24,247
266*	3,211	90.69	101½	44.80	307.70	16,121
836*	5,711	216.35	292¾	133.03	816.07	33,779
848*	5,748	240.19	218½	98.32	726.75	38,880
898*	3,938	152.38	154¼	80.70	407.95	25,652
958*	4,990	199.55	174	85.70	439.80	32,025
966*	5,699	230.17	314½	154.63	688.74	36,145
Totals	44,011	$1,543.03	1,858¾	$864.97	$5,630.02	268,488

Average cost of fuel per gallon	$0.0351	Miles per gallon of oil	144.4
Average cost of oil per gallon	$0.4653	Fuel cost per mile	$0.00575
Average miles per truck per month	6,712	Oil cost per mile	$0.00322
Average miles per truck per day	224	Repair cost per mile	$0.02097
Miles per gallon of fuel	6.10	Total cost per mile	$0.02994

*Sterling Truck FC-135 Model, with a Cummins six-cylinder diesel motor, pulling six-wheel, ten-ton trailer.

Weight of truck, empty	16,245 lb.
Weight of trailer, empty	15,500 lb.
Legal gross weight of truck and trailer	68,000 lb.

Table 2

Diesel Fuel Used, Lubricating Oil Consumed, Miles Operated—and Cost of Fuel, Oil, and Maintenance for First Four Months of 1935 and for Reference Designated As:

Group A-35

Truck No.	Fuel Used Gallons	Fuel Used Cost	Oil Used Gallons	Oil Used Cost	Repairs, Parts, and Labor Cost	Miles Operated
152*	3,890	$119.57	136½	$65.69	$401.55	22,455
174*	3,872	119.21	132¾	60.86	521.27	23,224
282*	2,199	67.27	95¾	45.46	616.53	10,587
284*	3,781	116.40	111¼	51.13	384.13	19,838
266*	1,650	51.02	77¼	35.44	170.64	8,250
836*	6,173	368.25	282¾	133.04	703.38	41,540
848*	6,342	330.44	242¼	113.63	837.74	38,800
898*	3,166	111.33	87½	41.12	494.94	20,190
958*	6,891	337.96	384¼	163.62	483.14	43,438
966*	3,816	117.59	173	79.87	838.61	19,410
Totals	41,780	$1,739.04	1,723¼	$789.86	$5,451.93	247,732

Average cost of fuel per gallon	$0.0416	Miles per gallon of oil	143.8
Average cost of oil per gallon	$0.4583	Fuel cost per mile	$0.00702
Average miles per truck per mo.	6,193	Oil cost per mile	$0.00319
Average miles per truck per day	208	Repair cost per mile	$0.02200
Miles per gallon of fuel	5.93	Total cost per mile	$0.03221

*Sterling Truck FC-135 Model, with a Cummins six-cylinder diesel motor, pulling six-wheel, ten-ton trailer.

Weight of truck, empty	16,245 lb.
Weight of trailer, empty	15,500 lb.
Legal gross weight of truck and trailer	68,000 lb.

Table 3

Gasoline Fuel Used, Lubricating Oil Consumed, Miles Operated—and Cost of Fuel, Oil, and Maintenance for First Four Months of 1934, and for Reference Designated As:

Group B-34

Truck No.	Fuel Used		Oil Used		Repairs, Parts, and Labor Cost	Miles Operated
	Gallons	Cost	Gallons	Cost		
160*	6,565	$860.55	115	$60.47	$428.66	21,366
270*	7,558	912.59	124	55.12	299.09	17,662
272*	7,019	830.53	153¾	68.93	157.83	23,075
274*	4,913	545.12	71	31.62	685.67	15,848
276*	7,124	852.63	115½	51.14	372.86	22,651
950*	6,143	742.20	134¼	64.13	313.36	19,939
956*	6,583	829.12	98	48.82	208.70	19,981
960*	6,638	774.12	89¾	40.61	261.44	19,930
826*	3,295	397.54	119¾	52.68	110.71	9,977
830*	4,245	529.74	128½	69.93	281.49	14,107
Totals	60,083	$7,274.14	1,149½	$543.45	$3,119.81	184,536
Average cost of fuel per gallon	$0.1216		Miles per gallon of oil		160.5	
Average cost of oil per gallon	$0.4727		Fuel cost per mile		$0.03947	
Average miles per truck per mo.	4,613		Oil cost per mile		$0.00294	
Average miles per truck per day	153		Repair cost per mile		$0.01689	
Miles per gallon of fuel	3.70		Total cost per mile		$0.05930	

*Sterling Truck FC-135 Model, with an AB Waukesha gasoline motor, pulling six-wheel, ten-ton trailer.
Weight of truck, empty ..... 15,645 lb.
Weight of trailer, empty ..... 10,500 lb.
Legal gross weight of truck and trailer ..... 68,000 lb.

Table 4

Relation of Basic Units for the Three Groups A-34, A-35, and B-34, as Recapitulated from Tables 1, 2, and 3 with the Addition of the Three Cost Factors Depreciation, Interest, and Insurance

Basic Units	Diesel Group A-35	Diesel Group A-34	Gasoline Group B-34	Average of A-35 and A-34
Average cost of fuel per gallon	$ 0.0416	$ 0.0351	$ 0.1216	$ 0.0383
Average cost of oil per gallon	$ 0.4583	$ 0.4653	$ 0.4727	$ 0.4618
Miles per gallon of fuel	5.93	6.10	3.70	6.01
Miles per gallon of oil	143.8	144.4	160.5	144.1
Fuel cost per mile	$0.00702	$0.00575	$0.03947	$0.00638
Oil cost per mile	$0.00319	$0.00322	$0.00294	$0.00321
Repair cost per mile	$0.02200	$0.02097	$0.01689	$0.02148
Totals	$0.03221	$0.02994	$0.05930	$0.03107
Depreciation*	$0.02960	$0.02960	$0.02700	$0.02960
Interest†	$0.00396	$0.00396	$0.00366	$0.00396
Insurance‡	$0.00067	$0.00067	$0.00061	$0.00067
Grand Total	$0.06644	$0.06417	$0.09057	$0.06530
Cost of gasoline truck per mile			$0.09057	
Cost of diesel truck per mile			$0.06530	
Differential in favor of diesel			$0.02527	

*Figured for life of 200,000 miles, less tires and 10 per cent junk value.
†Interest figured on one-half investment, for four years.
‡Insurance covers fire and theft only.

Table 5

Cost of Operating Diesel and Gasoline Equipment One Million Miles (Figures Obtained by Multiplying the Cost Per Mile from Table 4 by One Million) Also Increase or Decrease of Diesel Costs as Related to Gasoline-Equipment Cost

Basic Units	Diesel Truck	Gasoline Truck	Decrease	Increase	Per Cent Decrease or Increase
Cost of fuel	$6,380	$39,470	$33,090		—83.58
Cost of oil	3,210	2,940		$270	+ 0.91
Cost of repairs	21,480	16,890		4,590	+27.11
Depreciation (200,000 miles)	29,600	27,000		2,600	+ 9.63
Interest (half investment)	3,960	3,660		300	+ 8.19
Insurance (fire and theft)	670	610		60	+ 9.83
Total	$65,300	$90,570	$33,090	$7,820	—27.91
Deduct	$90,570		$7,820		
Net saving	$25,270		$25,270		—27.91

ther on a gallon of fuel than a gasoline motor.

2. The cost of fuel, per mile, for a gasoline-motored truck, is slightly over six times greater than for a similar diesel-motored truck.

3. A diesel motor uses slightly more lubricating oil than does a gasoline motor; and all other expense items, viz., oil, repairs, depreciation, interest, and insurance, are in every case greater for the diesel-motored truck.

Table 4 shows the combined costs for gasoline-truck operation to be $0.09057 per mile, and the costs of diesel-truck operation $0.06530 per mile—giving a differential, in favor of the diesel operation, of $0.02527 per mile.

In Table 5 it is seen that the cost of fuel for a diesel motor is 83.58 per cent less than for the gasoline motor, whereas the cost of repairs is 27.11 per cent higher. Incidentally, this is about the same repair ratio that is experienced by the operators of diesel trucks in Europe. Several reports available indicate their maintenance costs to be 26 to 31 per cent higher than the maintenance on gasoline-motored equipment. Table 5 also shows that whereas the saving on fuel is 83.58 per cent, the other expense items for the diesel motor are sufficiently greater so that this percentage is reduced to a net of only 27.91 per cent. This represents, however, for one million diesel-truck miles, a saving of $25,260.

Fuel economy is the chief reason for the use of the diesel motor. According to Table 4, the diesel-motored truck can be operated for a fuel cost of $0.00638 per mile, whereas the fuel cost for the gasoline-motored truck is $0.03947. The cost of diesel fuel would, therefore, have to increase 610 per cent before the fuel cost would equalize as between the two types of equipment. Since the net saving on the operation of the diesel, as shown by Table 4, is only $0.02527 per mile, the cost of diesel fuel would have to increase 390 per cent to equalize the cost of operation between the two types of equipment. It must be remembered, however, that the gasoline mo-

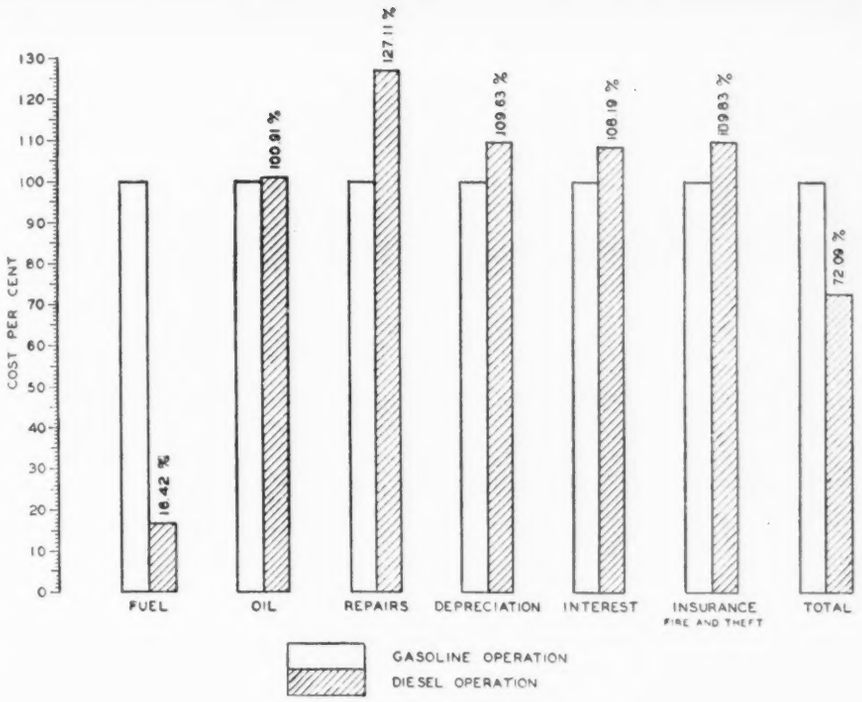

FIG. 1

tor, as we see it today, represents the result of 20 years of intensive development and improvement; whereas the automotive diesel is only in its fourth or fifth year of development—and only in its third year of intensive development—and is at the present time going through its formative stage.

It seems safe to assume that, under a larger scale of production, diesel motors will be produced at approximately the same cost as gasoline motors, so that there should be little difference in cost as reflected in the items for depreciation, interest on investment, and insurance. It is felt that in a very short time the maintenance cost of diesel equipment will be reduced to about the same level as the maintenance cost of gasoline-motored equipment. During the past year very pronounced changes have occurred in the design of connecting rods, pistons, liners, new types of valve-rocker arms, valve guards, valve locks, valve keepers, and injectors. The old parts are being replaced with those of new design as fast as they are perfected and proved in the factory. This replacement, incidentally, has been charged to maintenance cost—and with perfection of design such cost will be appreciably reduced.

Twenty-five of the 75 diesel engines in use by Pacific Freight Lines have been equipped with the new parts mentioned above, and a pronounced change in maintenance cost has resulted in the motors so far equipped. The experience with these new parts has not been of sufficient duration, however, to translate the saving into cost per mile.

Since maintenance cost in the operation of the automotive diesel engine is, and has been, such a moot question, it was felt that the check made over a four-month period might not be conclusive. An additional check was, therefore, made of 22 trucks—consisting of Sterlings, Macks, and Pierce Arrows, equipped with Cummins diesel motors—for a period of 12 months. This equipment operated 1,462,344 miles, and the cost of repair parts and labor amounted to $30,427.92, or a cost per mile of $0.02086. In comparison, this cost for four months, for the 10 trucks shown in Table 1, is $0.02097 per mile. For the 10 trucks, for the four months shown in Table 2, this cost is $0.0220 per mile; and the average of this cost, as shown in Table 4, was $0.02148. The difference between the maintenance cost per mile of this second miscellaneous group of trucks, calculated over the year, and the average obtained from Tables 1 and 2 is $0.00062, which would amount to only $620 for one million miles of operation. This would indicate that the study of the four-month period is just as accurate as that conducted for the longer period, and that the study of the 10 trucks produced the same result as a study of the larger group of 22 trucks would have produced.

The relative cost of diesel operation vs. gasoline operation is shown graphically in Fig. 1.

Fig. 1 gives a quick picture of the figures supplied by Table 5.

Accidents Fewer and Less Severe A.P.I. Reports

LOS ANGELES, Nov. 12.—Frequency of fatalities declined 17 per cent in the petroleum industry in 1934, while the severity of injuries declined 11 per cent, H. N. Blakeslee, director of the department of accident prevention of the American Petroleum Institute reported at its annual meeting here. The all-industry average of fatalities increased 11 per cent in 1934, and the severity 5 per cent, Blakeslee said.

The petroleum industry's record during the past four years shows decreases of 21.8 per cent in fatalities, 44.8 per cent in injuries per 100 men and 24.9 per cent in days lost from injuries per man as compared with the record in the preceding four years.

Awards for outstanding records in accident prevention during 1934 were presented by the institute to 20 companies. All-department awards were won by Standard Oil Co. of Indiana, Chicago and the Texas Pacific Coal and Oil Co., Fort Worth, Texas.

No accident records were made by departments in the Lincoln Oil Refining Co., Robinson, Ill.; Wadhams Oil Co., Milwaukee, Wis.; Hope Construction & Refining Co., Pittsburgh; The Ohio Oil Co., Findlay; Shell Oil Co., San Francisco; Yount Lee Pipe Line Co., Dallas and Magnolia Petroleum Co., Dallas.

Crankcase Oil Improved by "Dope" Selected After Extensive Research and Tests

ALTHOUGH the problem of selecting an oil in the laboratory for its true lubricating value is as yet unsolved, the present day need for a better lubricant has been answered in two general ways, it was brought out in the second part of the discussion on Improved Lubricants and Lubrication by L. L. Davis, B. H. Lincoln and B. E. Sibley of Continental Oil Co., before the A. P. I. meeting at Los Angeles. Improved refining methods give better physical and stability characteristics, and the use of addition agents improve these same properties as well as add to the true lubricating value the authors state.

The many factors which must be considered in the search for an addition agent—load-bearing capacity, oiliness, rate of wear and corrosiveness on bearings and cylinders, oxidation and thermal stability, volatility and toxicity—narrowed the selection to the ester of a chlorinated aliphatic acid and a monohydric alcohol such as methyl-a, a-dichlorostearate, it was found. This selection was further strengthened by actual service tests on the road.

Basing their work on the original discovery that lubrication was improved by the addition of small amounts of free fatty acid, the Continental Oil Co. research staff was convinced that lubricating improvement could best be obtained by the formation of an adsorbed film of the addition agent on metal surfaces. To form such a film of high adsorption energy, a fatty-acid type of molecule was believed desirable, i.e., a long straight-chain hydrocarbon with very high polarity at one end. The first step was to increase the polarity of a fatty acid by halogenation. The halogen, however, increased the acidity of the fatty acid to such an extent as to make the material unsatisfactory. The next step was to overcome the acidic and still retain the polar characteristics. This was accomplished by methylating.

Attention was called to the "flood of doped oils" which have been put on the market. It was pointed out that one of the most frequent claims for these oils is high film strength, a desirable quality but one which can be imparted to oil by powdered abrasives among other materials. This illustration was used to show more forcibly that lubricating value is determined by, not one, but many factors.

In an investigation which included the study of over 1000 organic compounds, four general steps were used: a theoretical investigation of the forces of the adsorbed film and the regimentation of molecules in oil solution; a chemical laboratory study of stability, corrosion, toxicity, and different crude properties; a physical laboratory study; and road tests.

Film strength was tested on the Timken apparatus. The Timken "film-strength" is defined as the load on the beam, in pounds, at 788 r. p. m. and at 100° F. for 10 minutes, which gives incipient scarring of the bearing surfaces. In order to obtain reproducible results it was found necessary to use an automatic loading device. Fig. 1 shows the effect of rate of loading on film strength. A standard rate of 22.8 pounds per minute was used in all tests. The relationship between viscosity and film strength is shown in Fig. 2. The vertical bars between the crosses represent the range in film strength of all the commercial mineral oils which were tested.

The Timken film strength does not consider rate of wear or corrosion and, therefore, is not an indication of what might be termed "useful load-carrying capacity."

The Timken machine was used to study rate of wear by using a block of the bearing metal and a steel cup highly-polished with Aloxite powder and oil. The weight loss of the bearing block was used as a measure of the rate of wear. The results of the short-run, high-load wear test are given in table 1; those of a series of six-hour runs with cadmium-silver blocks at low loads are given in Fig. 3.

The Almen machine, like the

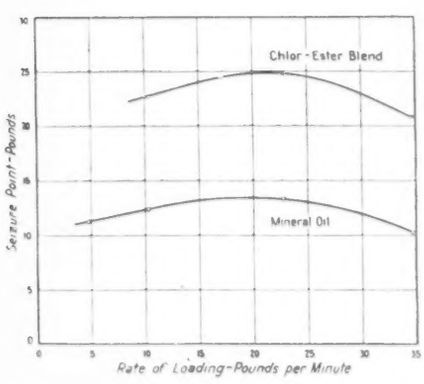

Fig. 1—Relation between Timken film strength and rate of loading

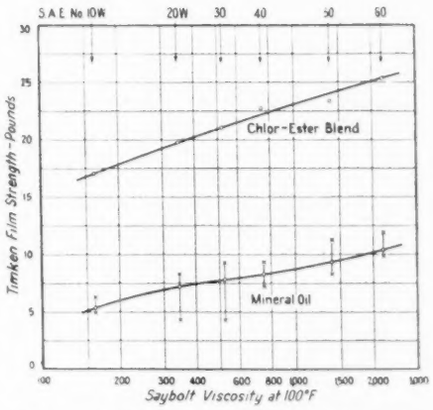

Fig. 2—Relation between Timken film strength and viscosity

Timken machine, is normally operated with steel-on-steel bearing surfaces. Information of the value of addition agents by using the Almen machine were obtained for long-time wear tests by using steel-on-bronze. The results are given in table 2.

The first column gives the standard Timken tests for purposes of comparison. The second column is the standard Almen film-strength test made with steel-on-steel at 600 r. p. m. and applying the load at the rate of 1000 pounds per 10 seconds. The "film strength" is reported as the number of pounds per square inch of projected area the lubricant will carry for 10 seconds without seizure.

The third column is the Almen film strength using steel-on-bronze bearing metal. The test was conducted with the same procedure used in the regular Almen test. The fourth column gives the results of a one-hour wear test under a 2000 - pound - per - square-inch load. The loss in weight of the bronze pin gives the relative wear.

The fifth column records the data from a three-hour reversing wear test of steel-on-steel. The reversing mechanism was so designed that the machine operated in one direction at full speed, slowed to a full stop, and then accelerated to full speed in the opposite direction with a 1¼-minute cycle between stops. The load was 2000 pounds per square inch.

A study of table 2 reveals that film strength alone, without consideration of wear, does not fully define a satisfactory lubricant, it was indicated. Table 3 gives the results of a series of wear tests at different loads for a mineral oil and the same oil plus chlor.-ester (methyl-α, α-dichlorostearate). The very low wear at excessive loads resulting from the use of the chlor.-ester blend seems to be an unusual property, it was stated, as with the exception of chlorinated stearic acid all other products examined which show low wear at 2000 pound loads will either seize or show greatly increased wear at 8000 pounds.

As regarding the corrosion problem, it was concluded that

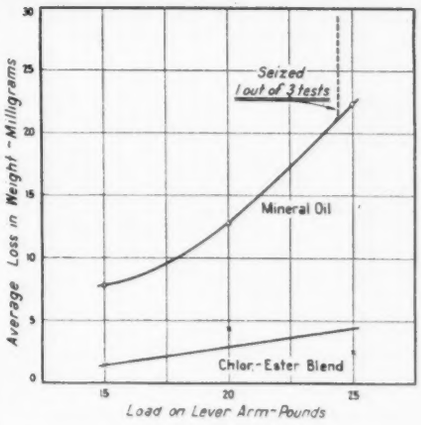

Fig. 3—Timken long-time wear tests on cadmium-silver bearing metal

compounding agents must be stable and non-corrosive in their unblended concentrated state, must not decompose in service to form corrosive materials, and must not accelerate the oxidation of the oil to form corrosive products, but should act preferably as inhibitors.

The first factor is easily tested by any of the usual strip-corrosion tests on the compounding agent itself. All types of metals found in automotive equipment were studied and the results are given in table 4. The surprising thing was the wide range of corrosion found on supposedly satisfactory mineral oils, extensively-advertised and widely-distributed brands.

The beaker corrosion test is of questionable value on the cadmium alloys on account of the formation of protective sludge films. A connecting-rod-bearing corrosion-testing machine, recently designed by B. E. Sibley, overcomes this difficulty by continually removing

Table 1

Timken Wear Tests on Bearing Metals

		Load on Beam—Pounds			
		20	40	60	80
Metal	Oil	Loss in Weight—Grams			
SAE-11	Mineral	0.0019	0.0040	0.0058	0.0091
	Chlor.-ester blend	0.0014	0.0026	0.0034	0.0071
Cadmium No. 50	Mineral	0.0026	0.0075	Seized	.....
	Chlor.-ester blend	0.0011	0.0056	0.0073	.....
Cadmium No. 51	Mineral	0.0025	0.0033	Seized	.....
	Chlor.-ester blend	0.0006	0.0030	0.0047	0.0062
Copper-Lead	Mineral	0.0013	0.0336	0.0390	Seized
	Chlor.-ester blend	0.0004	0.0035	0.0153	0.0316
Bronze No. F-1	Mineral	0.0129	Seized	.....	.....
	Chlor.-ester blend	0.0021	0.0015	0.0046	0.0054

Table 2

Almen-Machine Film-Strength and Wear Tests

Oil Plus 1 Per Cent Addition Agent	Standard Timken Film Strength (Pounds)	Almen Film Strength, Steel-on-Steel (Pounds)	Almen Film Strength, Steel-on-Bronze (Pounds)	Almen Wear Tests Steel-on-Bronze Loss in Grams)	Reversing Steel-on-Steel (Loss in Grams)
Mineral oil	9.3	3,500	6,000	0.586	0.451
Methyldichlorostearate	28	6,000	15,000+	0.036	0.003
Trichlororesorcinol	125	8,500	15,000+	0.006	0.003
Dichlorostearic acid	59	5,500	15,000+	0.003	0.003
Oleic acid	8.3	4,333	6,000	0.041	0.003
p-Chloroanisole	25.5	5,000	5,000	0.408	0.216
Dichloropropylether	44	6,500	6,000	0.477	0.008
Pentachloroethane	38	10,000	15,000+	0.002	0.006
Chlorodyiphenyl	25.5	6,500	5,000	0.757	0.008
Chloropseudocumene	15.5	4,500	5,000	0.471	0.717
Tetrachloroethylene	15.5	7,000	5,000	0.611	0.004
Hexyl chloride	8.8	5,500	15,000	0.266	0.208

Table 3

Almen-Machine One-Hour Wear Tests—Steel-on-Brass

Load (Lb. per Sq. In.)	Grams Loss in Weight of Brass Pin	
	Mineral Oil	Chlor.-Ester Blend
250	0.012	0.008
500	0.010	0.014
1000	0.058	0.050
2000	0.859	0.040
4000	Seized	0.036
6000	.....	0.017
8000	.....	0.009

the film. Table 5 shows the results of runs made on cadmium-silver and copper-lead bearings with four different oils. Some comparative road tests on connecting-rod bearings are shown in Table 6.

Cylinder and piston-ring corrosion was studied in the laboratory using a 12-inch-diameter wheel rotating horizontally at 15 r. p. m. Test strips were arranged radially around the perimeter. As the wheel rotated, the test strips came in contact with a jet of saturated steam to which could be added vapors of hydrochloric, acetic, and formic acids, carbon dioxide, etc. After one hour, rust was removed and the loss in weight determined.

The rate of wear was measured using the same Chevrolet engine-dynamometer assembly used for consumption tests. The results of these tests as well as those in connection with car and fleet-test work were said to show substantially in favor of the chlor.-ester blend, the average wear with the mineral oil being 40 per cent greater than with the compounded oil.

One of the most important factors in the selection of an addition agent is the question of its effect on the stability of the oil in which it is blended, it was stated. Many products which are very desirable from most standpoints, prove to be oxidation catalysts, and increase the rate of sludge and acid formation in the crankcase oil.

There is no satisfactory laboratory method available today which will measure the relative stability of lubricants in terms of actual changes they will undergo in service, it was indicated. It is, therefore, necessary to depend upon actual tests on the road to study crankcase-oil service changes. Tests of this kind also gave the edge to the treated oil, the authors showed.

The term "oiliness", said to cover a multitude of opinions and hypotheses on the theory of lubrication, should be limited to that phase of lubrication which considers the coefficient of friction under boundary and thin-film conditions, it was asserted. A compounded oil may have oiliness without high load-carrying ability. The newer products, such as the chlorinated esters, may have both oiliness and film strength, which permits the oiliness characteristics to function at higher loads and temperatures than in the case of the fatty acids.

It is probable that the characteristic of oiliness, as differentiated from film strength, is the result of the formation of a true adsorbed film of substantial thickness and permanence of polar molecules, the authors believe. One example of the relative oiliness value of two oils was given in which torque was plotted against bearing load, showing the advantage of the chlor.-ester blend over straight mineral oil. It is impossible in practical road tests to isolate the effects of oiliness as defined above, it was pointed out.

The question of a relationship

Table 4

Beaker Corrosion Test on Bearing Metals

Product SAE-30	Agent Used (Per Cent)	Loss—Milligrams Per 100 Sq. Cm. Copper	Copper-Lead	Cadmium-Silver	Timken Film Strength (Pounds)
Plain Mineral Oils:					
1. Conoco Mid-Continent base	..	2	2	0.6	8.8
2. Solvent-treated Mid-Continent base	..	7.5	10	.....	7.3
3. Solvent-treated Eastern base	..	10	12	.....	5.3
4. Eastern base	..	7.5	23	.....	8.3
5. Naphthene base	..	16	36	.....	9.6
6. Eastern base	..	6.8	1.2	.....	8.3
Oil No. 1 Plus Addition Agent:					
7. Methyldichlorostearate	1	4.5	5.2	.....	28
8. Pentachloroethane	1	2	2	.....	.....
9. Dichloropropylether	1	8	10	1.4	44
10. Trichlorophenol	1	....	15	.....	49
11. Trichlororesorcinol	1	25	1	.....	125
12. Triphenylchloromethane	1	77	95	0	74
13. p-Chloroanisole	1	69	79	0.5	26
14. Dichlorostearic acid	1	..	140	16	45
15. Oleic acid	1	..	430	485	8.3
Commercial Compounded Oils:					
16. Chlor.-ester blend	0.75	2.7	4.8	1.6	23
17. Isopropyl esters of oxidized wax	2	16	116	.....	4.3
18. Chlorinated petroleum hydrocarbons, probably wax	5	42	65	.....	21
19. Processed castor oil	5	13	150	123	10.8
20. Chlorinated petroleum	0.2*	16	90	.....	36
21. Ketones, etc., from oxidized petroleum	....	19	40	.....	15
22. Chlorinated hydrogenated fish oil	0.3*	49	153	.....	19
23. Chlorinated diphenyl	0.4*	3	31	.....	25
24. Pentachloroethane	2.0*	27	5	.....	28
25. Chlorinated naphthalene	1.2*	2	66	.....	31
26. Esterified oxidized petroleum hydrocarbons	3	5	35	.....	17
27. Voltolized glyceride	10	8	22	.....	.....

*Per cent of chlorine in blend.

Table 5

Connecting-Rod-Bearing Corrosion Tests on Sibley Machine

	Weight Loss in Grams				
	Continental Oils		Solvent-treated Oils		
	Chlor.-Ester Blend	Mineral	Mid-Continent Base	Mid-Continent Base	Eastern Base
Cadmium-Silver Bearings:					
No. 1 cap insert	0.0864	0.9526	1.2506	1.5801	2.1586
No. 1 rod insert	0.0980	0.9105	0.9724	1.4921	0.4365
No. 2 cap insert	0.0789	0.9818	1.7419	1.9430	1.4616
No. 2 rod insert	0.0709	0.8782	0.8981	1.3298	2.0556
Average loss per insert	0.0836	0.9308	1.2158	1.5863	1.5381
Copper-Lead Bearings:					
No. 5 cap insert	0.0079	.....	0.2118	0.3007	0.4387
No. 5 rod insert	0.0191	.....	0.2673	0.2259	0.3929
No. 8 cap insert	0.0111	.....	0.1964	0.3170	0.0084
No. 8 rod insert	0.0176	.....	0.2153	0.2944	0.3962
Average loss per insert	0.0139		0.2227	0.2845	0.4191
Length of test, hours	22	22	22	22 ½	22
Average oil pressure, lb. per sq. in.	29	35	29	33	33

THE FOLLOWING ADVERTISEMENT WHICH APPEARED IN THIS MAGAZINE TWO WEEKS AGO CONTAINED A TYPOGRAPHICAL ERROR — WE ARE HAPPY TO CORRECT THE MISTAKE AND TO REPEAT THE ADVERTISEMENT BECAUSE THERE IS NO MISTAKING THE IMPORTANCE AND VALUE OF POLYMER GASOLINE TO YOU

What blending value means in
POLYMER GASOLINE

The blending value of Polymer gasoline is 115 to 125

That means 5 gallons of it blended with 95 gallons of 57 octane gasoline gives you 100 gallons of 60 octane gasoline

Five gallons of Polymer gasoline and 95 gallons of 63 octane make 100 gallons of 65 octane

Five gallons of Polymer gasoline and 95 gallons of 68 octane make 100 gallons of 70 octane

Catalytic polymerization of your cracked gases (which cost you nothing) will give you enough Polymer product to carry all your gasoline over the deadline into the higher octane brackets

Figure out what this would mean to you

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

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Table 6

Rate of Wear of Connecting-Rod Bearings in Service

Percentage Composition of Bearing Metal	Car	Speed	Rate of Wear of Connecting-Rod Bearings (Grams per 10,000 Miles): Mineral Oil	Chlor.-Ester Blend
Copper-Lead:				
Copper—58.9	Studebaker[1]	Break-in	0.0924	0.0728
Lead—40	Studebaker[1]	4,000 r.p.m.	0.5183	0.4569
Nickel—1.1	Studebaker[2]	50+m.p.h.	0.3424	0.1174
	Studebaker[2]	50+m.p.h.	0.4232	0.2315
	Buick-8[3]	50 m.p.h.	0.0544	0.0449
High Lead:				
Lead—98	Buick-8[3]	Break-in	0.1864	0.1856
Alkaline-earth metals—2	Buick-8[3]	50 m.p.h.	0.1024	0.0955
Copper-Lead:				
Lead—36	Ford V-8 truck[4]	Break-in	0.8232	0.7112
Copper—64	Ford V-8 truck[4]	50 m.p.h.	0.3781	0.2583
Cadmium-Silver:				
	Pontiac, 1935[5]	50+m.p.h	.....	0.0922

[1] Studebaker model "C" President engine connected to a G. E. 150-hp. dynamometer.
[2] Studebaker model "C" 1934 President coupe.
[3] Conoco test fleet of Buick-8, model 33-67, 4-door sedans equipped with special bearings as noted.
[4] Conoco Ford truck test fleet, Ford V-8 1½-ton trucks.
[5] Pontiac-8—1935 sedan.

between oil consumption and the use of an addition agent is controversial, and must depend upon the future for final proof. However, figures were given which indicated cases in which greater mileage had been obtained with the treated oil. The addition agent may be consumed independently of the oil also, it was stated, the more volatile agents being quickly lost.

In general, it was said that the small quantity of an addition agent has little or no effect on the physical characteristics of the oil, but a few factors must be considered in the final selection of a product. It should be perfectly soluble at all temperatures, so that neither the cloud nor the pour test is raised. The more volatile products may depress the flash point. The material must not be water soluble or tend to increase the emulsifying characteristics of the oil. As a rule, the ester type of compound has low viscosity and a high viscosity index, but is used in too small a quantity to make an appreciable difference in the mineral oil.

Neither a compounding agent nor its decomposition products should have any toxic or obnoxious — such as odorous, anaesthetic, or corrosive — characteristics. The laboratory and road test data submitted in the paper showed that all the requirements named can be secured by the use of a chemically-stable highly-polar compound such as the esters of chlorinated aliphatic acids and monohydric alcohols, and specifically, methyl-α, α-dichlorostearate.

Utility-Refiner Steam Plant is Suggested

"When can I generate power cheaper than I can buy it," asks the refiner. The question was answered and a method of approach to the problem given by Roy B. Bryant and M. E. Dice of General Petroleum Corp. at the Annual Meeting of the American Petroleum Institute at Los Angeles, Nov. 13.

Steam turbines appear more economical than diesel engines but electric motors are more economical for most individual refinery drives than non-condensing steam turbines, horsepower of the individual unit being under 300, it was stated. At present fuel costs and power rates in California, none of the three proposals was found attractive at 30 per cent plant-load factor; all were attractive at 60 per cent or better. High plant-load factors, involving a minimum of excess capacity to guarantee service during peak demands, are most difficult to attain when such guarantee is essential.

Low-priced fuel, high-purchased power rates, and high load factors are the circumstances required for rapid repayment of plant investment against purchased power. The ability to generate power at a saving, therefore, depends largely (if not entirely) on the refiner's ability to utilize constantly a good percentage of generating capacity, it was stated.

A steam plant jointly owned by a refinery and a utility; inter-connected with the utility's system and supplied with cheap fuel by the refiner, was suggested. It was pointed out that there are at least three co-operative enterprises of this nature in operation in this country. The saving to the utility on primary transmission investment would go far toward building the steam plant, it was indicated. With greatly-reduced fixed and operating charges for transmission, current could be sold very cheaply at the generators.

The refiner would have a better outlet for his non-commercial fuel, would be well protected against power failure, and would be better prepared to meet future changes in either steam or power loads. Heat savings would be important, because hot tar could be burned direct from the refinery.

Costs were compared over a wide range of power rates, fuel costs and monthly power consumption. Final comparisons were made by charts which took any set of conditions for a given plant, and solved directly for the time in years required for the savings to re-pay the investment with interest.

Transferred to St. Louis

TULSA, Oct. 30.—James T. Branch, formerly office assistant to Vice-President George S. Rollin of the Kansas-Oklahoma-Panhandle district of the Shell Petroleum Corp., has been transferred from Tulsa to St. Louis where he will become a member of the president's staff of the Shell corporation.

Specialized Greases Required for Proper Lubrication of the Modern Car

Presented before American Petroleum Institute, Los Angeles, Nov. 11-14, 1935, under the title "Chassis Lubricating Greases."

By Ralph R. Matthews*

A SURVEY made by the Department of Statistics of the Institute in 1934 showed that the consumption of lubricating greases for chassis lubrication of automotive equipment was estimated at 1.56 lb. per 100 gal. of gasoline. On a basis of total gasoline consumption, that would mean approximately 285,000,000 lb. Since considerable gasoline may have been used for other than automobiles, trucks, and buses, these figures may be a little high — but undoubtedly the total amount was well over 200,000,000 lb.

If one listens to automobiles squeaking along on our streets and highways, it is readily apparent that, even though the above figures seem very large, there is still an enormous potential market if drivers could be converted to regular greasing periods. This, of course, applies particularly to passenger automobiles, as fleets of trucks and buses usually receive better attention.

When the gasoline supply of an automobile is exhausted, the engine stops and gasoline must be purchased if further progress is desired.. However, that same car can squeak, squeak, squeak for mile after mile, practically crying for grease—and there is no response from the driver. How much pleasanter and safer it would be for such people if their automobiles could balk and refuse to move until thoroughly greased.

It seems that the gospel of specialized lubrication, requiring the application of proper and specific lubricating greases to the automobile chassis, has been so widespread that all greasing is now done that way. Actual field contacts, however, are a sad revelation that many are still stocking only two or three products and do not have the proper equipment for first-class work. Thus, the motorist who wants an efficient grease job should still first investigate as to equipment and lubricating greases available.

Progress is being made, however, in converting all concerned to the correct application of the various needed lubricants at the proper time intervals. The large and some small oil companies have been active. The manufacturers of lubricating greases have passed out a world of information to their trade. The Chek-Chart Corp. has been, and is, doing a fine work in that direction by providing durable, authentic charts giving complete lubrication details of all automobiles The "Service Man's Guide to Automotive Lubrication," issued by them, is high in educational value. Their bulletins and consulting service are also most helpful to those who wish to keep right up-to-date.

Churchill[1] last year called attention to changes in design which would make chassis lubrication easier. However, manufacturers evidently feel that style must come first; so now we have skirts and changes in body design which really make correct greasing more difficult.

Blackwood and Spencer,[2] in their excellent paper on chassis-lubrication problems, clearly show the need for standardization of chassis parts requiring lubrication and changes which would mean better lubrication. If that could be done by the automobile manufacturers, it would surely lend much encouragement to the development of standard specifications for chassis lubricating greases, as urged by Mougey,[3] and eventually result in simplification with fewer greases necessary.

It is logical to assume, however, that the automobile manufacturers are in the same position as the manufacturers of lubricating greases, in that differences have sales value of more or less importance. With the automobile, however, a careful analysis might show that other features could be stressed with as good or better results.

Safety Should be Stressed

A very laudable campaign is now being made to reduce automobile accidents. The loss of life and those maimed forever are bad enough, but there is also a terrific economic loss due to lost time and destroyed property.

While in general it is true the driver is responsible for the accident, the condition of the automobile also has a bearing. If it has not been greased for months, difficult handling or slow response may cause a wreck.

Frequently we read of accidents caused by broken steering gears. No doubt wheel bearings, universal-joint failures, or gear trouble may sometimes be responsible — even though something else is blamed.

Those charged with lubrication of automobiles have a grave responsibility. They should see that the correct lubricating greases are properly applied at the stated intervals. They should also urge, and keep on urging, all automobile drivers to have their cars greased

*Battenfeld Grease & Oil Corp., Kansas City, Mo.

regularly. It is an extra insurance against accident which has a small annual cost.

Chassis Equipment

Before discussing chassis lubricating greases, it might be well first to consider briefly the equipment on which they are used, as that has influenced the type and consistency of the greases. Since the largest quantity of lubricating grease is consumed on shackles and related bearings, shackles and bearings are placed first.

Shackles

The old-so-called straight-bolt shackle is slowly passing out of the picture due to the development of more efficient types. Among the first of these was the Tryon shackle, which embodies reservoirs of lubricant, and was an effort to get away from the "freezing" of shackle bolts which had been prevalent—especially where greasing was neglected. There is also an excellent arrangement for keeping the shackle tight. Unfortunately, the manufacturers of that shackle and the automobile manufacturers did not specify the best lubricant or give sufficient publicity to the effect that a special type was necessary. First a transmission oil was recommended; and when it was found to empty from the grease reservoirs too quickly, felts were placed at the ends of the reservoirs—but they were not entirely satisfactory. In the meantime lubricating-grease manufacturers had found that a semi-fluid pressure-gun grease was best, and were calling the attention of their trade to the necessity for its use. The application of pressure-gun greases not of semi-fluid consistency and transmission oil caused undue wear which required the replacement of thousands of Tryon shackles.

About the same time the roller-bearing type of shackle, requiring lubrication only at long intervals, was brought out. It seemed to be satisfactory; but apparently was found too expensive, as it was discontinued except on higher-priced models.

The threaded shackles next appeared, the first being a threaded bolt with the conventional hole for the grease going to the center so it could spread each way on the threads. Later came the so-called "U" type, with threads on both arms of the "U," and the grease applied at the ends of the sleeves. Threaded shackles of some sort are decidedly in favor at present.

It will also be recalled that rubber shackles were earlier used all around on some cars; but evidently did not give best results, as most recent models have a rubber shackle at one end of the spring and a threaded shackle at the other. Rubber or rubberized shackles are apt to develop squeaks which are hard to eliminate, because oil or grease causes deterioration of rubber. Glycerin mixtures have been used, but do not last long.

There have not been any particular changes in tie rods, king pins, or drag links. Probably the bearings are somewhat more serviceable than formerly. Since these parts have an intimate connection with proper and safe steering, it is most important that they be efficiently lubricated at all times.

Individual front springing has introduced bearings which add a little to the quantity of pressure-gun grease needed for chassis lubrication of such cars. Those servicing such equipment have found that greasing more frequently is necessary if wear is to be prevented. Even where the most durable type of grease is used, such has proved to be the case.

Wheel Bearings

The increased use of roller bearings in recent years has made better wheel-bearing greases necessary, as it was found that roller bearings were somewhat harder to lubricate than ball bearings. Four-wheel brakes made it obligatory to use a lubricating grease which had good resistance to the softening effect of heat, so the grease would not leak or flow onto the brake bands. The bearing manufacturers are giving much attention to lubrication and, acting in unison, are doing work on a machine which will provide accelerated tests of wheel-bearing greases. If practical, such apparatus should be helpful in assuring better wheel-bearing lubrication.

Steering Gears

Improvements have been made in both cam-and-lever and worm types of steering gears. Particular attention has been given to ease of operation, rugged construction, and safety. One manufacturer of the former type has developed a rotating cam which has proved to be a signal improvement. At times high pressures are produced on bearing surfaces of steering gears and, consequently, extreme-pressure greases are finding favor for most efficient lubrication.

Universal Joints

The introduction and present use of roller or so-called needle-type universal joints means a decided change in lubrication requirements. The old-style grease-lubricated joint and that serviced with oil will slowly pass out of the picture, and the demand for such grease will eventually be relatively small. Mileage intervals recommended for lubrication of the needle-bearing universal joints are long, and in some cases for life of the car. The latter, however, will not generally be endorsed by those wishing best lubrication. Splines must be greased regularly, but the right type of pressure-gun grease is satisfactory. As all power from the engine must pass through the universal joint or joints, it is highly important that they be effectively lubricated.

Water Pumps

Some grease-lubricated water pumps are now being made so the bearings are not in contact with the circulating liquid. That is a good improvement, because it minimizes the danger of grease being carried to and deposited onto cooling surfaces with resulting loss of cooling efficiency. Even for such pumps, the water-pump grease should be high enough in dropping or melting point to resist the softening effect of the hot circulating liquid. Some are using an oil-lubricated water pump; but if the owner is neglectful, wear may result sooner than with grease-lubricated water pumps.

The Lubricating Greases for the Chassis

Pressure-Gun Grease

Even though the cars equipped with straight-bolt shackles and also Tryon shackles will eventually no longer be in service, there are now many being driven every day. Consequently, those offering efficient lubrication service must have pressure-gun greases particularly suitable to individual types of shackles or, obviously better, one which will effectively care for all kinds, as stocks are thereby reduced and less greasing equipment required.

As previously mentioned, the use of the Tryon shackle led to the manufacture of semi-fluid pressure-gun greases which, as the name indicates, have more fluidity than those previously in use. It was also found that, if a lubricating oil of higher viscosity was used, the durability of the grease was increased. Further, such a product proved very satisfactory for straight-bolt shackles and all types of threaded-bolt shackles. Thus, it answered the need for a product suitable for all shackles.

One of the desirable attributes of a lubricating grease for Tryon and also threaded shackles is the property of feeding slowly and steadily from the grease reservoirs to the bearing surfaces. It has seemed that a little tackiness is helpful in that direction, and also assists the grease in clinging to the bearing surface. There should not be so much, however, as to cause the grease to string away at length from the fitting after the gun has been disconnected. Reference to grease reservoirs of the threaded shackles is made because the ends of the sleeves of "U" shackles hold some grease which can feed to the threads, and the same action occurs to a limited degree from the grease passages of other threaded shackles.

In view of their utility, semi-fluid pressure-gun greases or chassis lubricants, as some prefer to call them, have naturally grown in favor. Calcium, sodium, and aluminum bases are all being used in their manufacture. Probably some of mixed base are also offered to the trade.

Since A. J. Stevens, in about 1925, perfected a method for the manufacture of aluminum-base lubricating greases of uniformity and good keeping quality, they have gained in popularity. The solubility of the base in oil eliminates the necessity of any "tie water," and with the proper oil gives a lubricating grease of such clarity and attractive appearance that its purity cannot be questioned. That has proved a decided sales asset.

THE presence of only a trace of moisture allows this product, as a whole, to serve as a lubricant, and thus increases its effectiveness. No deterioration and no hardening with age are valuable properties from the standpoint of storage and elimination of clogged fittings which are possible with other types of lubricating greases, particularly if regular greasing is neglected.

Because of the above, and because of excellent service results, the volume of aluminum-base semi-fluid pressure-gun greases manufactured has increased each year. In addition to use as a chassis lubricant, they give fine results in lubricating speedometer and cables, oil-type universal joints, oscillating mechanism of windshield wipers, the springs, and other points where squeaks develop.

Klemgard[1] with his special laboratory service-testing apparatus, using straight-bolt and threaded shackles, has shown that aluminum-base pressure-gun greases have as good resistance to emulsion with water as calcium-base greases. That conclusion is amply supported by road service. Grease-retention tests showed a comparatively high loss at first, after which the curve flattened—with plenty of grease remaining for satisfactory lubrication. The approximate composition of semi-fluid pressure-gun greases is shown in Table 1.

In view of the federal excise tax on lubricating greases with a worked pentration of over 390, the summer grades of most semi-fluid pressure-gun greases are kept below that figure.

Most consumers have found a winter grade necessary in sections experiencing cold winter weather. It is manufactured in a lighter consistency, and generally contains an oil somewhat lower in viscosity. That grade is necessary not only from the standpoint of application—especially where closed greasing facilities are not available—but also so that the lubricating grease will not be too stiff to function properly at low temperatures.

Extreme-pressure lubricating greases for this purpose have been advocated by some; but it has been largely for sales reasons, as only heavily-loaded trucks might possibly profit by their use.

Of course, large quantities of soft cup greases and gun greases containing low-viscosity oils—also probably transmission oil—are still used for chassis lubrication. Those applying such products purchase on price only, and overlook the fact—or do not care—that their unsuitability and lack of durability cause excessive wear.

Wheel-Bearing Grease

In general, automobile manufacturers, with the support of the companies making bearings, are recommending a short-fiber soda-base grease containing an oil of not less than 300 Saybolt viscosity at 100° F. for lubrication of wheel bearings.

The relatively high softening point of such a product no doubt is the primary reason for its choice—this to minimize the

TABLE 1

Approximate Composition of Semi-Fluid Pressure-Gun Greases

	Soap Content (Maximum)	Water (Maximum) (Per Cent)	ASTM Worked Penetration	Texture	Saybolt Viscosity of Oil Content (Minimum)	Color of Oil
Aluminum base	11% aluminum	Trace	340-380	Tacky	150 at 210 °F.	Black
Aluminum base	9% aluminum	Trace	340-370	Tacky	110 at 210° F.	5-6 ASTM
Calcium base	8% calcium	1	340-380	Smooth	95 at 210° F.	Black
Calcium base	6% calcium	1	350-400	Smooth	140 at 210° F.	8 ASTM (max.
Sodium base	5% sodium	0.25	360-390	Tacky	175 at 210° F.	Green

TABLE 2

Specifications of Typical Wheel-Bearing Greases

	Soap Content (Maximum) (Per Cent)	Water (Maximum) (Per Cent)	ASTM Worked Penetration	Dropping Point (Minimum) (Deg. F.)	Texture	Saybolt Viscosity of Oil Content (Minimum)
Calcium base.....	18	1	185-215	200	Smooth	480 at 100° F.
Sodium base.....	13	0.5	280-310	325	Fibrous	130 at 210° F.
Mixed base*.....	18	0.5	250-390	290	Fibrous	120 at 210° F.

*Not more than 3 per cent of calcium base; balance sodium base.

Non-corrosive EP base can be added in proper proportion to any of the above greases if an EP wheel-bearing grease is desired.

tendency of the grease to get over onto the brake bands.

Klemgard[4] found in his laboratory service tests that calcium - base wheel - bearing greases leaked badly in comparison with sodium-base products, with consequent development of higher temperatures. The fact remains, however, that thousands of pounds of the former have been used with satisfactory results on passenger automobiles. The instruction book of one automobile company still recommends a No. 2½ cup grease. No doubt correct applicatiton of limited quantities of a calcium--base wheel-bearing grease has a distinct bearing on the service obtained.

From the standpoint of safety, and also lubrication, the ideal combination for a wheel-bearing grease would embody good resistance to softening by heat, also a smooth texture and consistency—causing it to follow closely the bearings with a complete cushioning effect. Greatest durability would probably be obtained where the worked and unworked penetrations are fairly close together. The lubricating oil in the grease should not be below the minimum viscosity noted above, and not so high as to interfere with the grease functioning as suggested. In order to approach these desired characteristics, some manufacturers are marketing a mixed-base wheel-bearing grease containing both calcium- and sodium-base greases.

Typical wheel-bearing greases on the market are covered by the abbreviated specifications in Table 2.

While pressures developed on wheel bearings of passenger automobiles are ordinarily not high, there is a growing sentiment for the use of EP wheel-bearing grease. Maag[5] has pointed out the advantages of that type for lubrication of bearings in industrial use and predicts: "Most greases of tomorrow will undoubtedly be of the extreme-pressure type."

At least one automobile company is experimenting with EP wheel-bearing grease, and has found it helpful in protecting the bearings during the break-in period. No doubt for trucks in heavy-duty service such a wheel-bearing grease would be more effective; so it might be best to give extreme-pressure properties to all wheel-bearing greases, and thus avoid the necessity of stocking another grade. "Mild" EP properties should be satisfactory, and thus the lubricants would only need to pass 24-26 lb. when tested on the Almen machine.

The work of Farrington and Davis in studying microscopically the length of fiber[6] will be helpful in classification of this type of lubricating grease, since heretofore it has not been possible to answer the question: "What is a short-fiber grease?" Most manufacturers have had to depend on the finger test of skilled grease makers.

Steering-Gear Grease

Many rendering lubrication service do not carry a special steering-gear grease. They apply gear lubricant of either the fluid or fibrous type. While a lubricating grease manufactured specifically for that purpose gives best service, gear lubricant is fairly satisfactory — provided the housings are tight enough to hold the fluid type, and if it has extreme-pressure properties.

Resistance to channeling at low temperatures must necessarily be taken into consideration in sections having cold winters. This is very important either when a gear lubricant is used or a steering-gear grease, since it has a direct bearing on the ease of operation and response in driving.

As previously pointed out, the steering gear and connections should have careful and regular lubrication. Failure in any way at a critical time may easily result in a dangerous accident.

Since the demand for steering-gear greases is limited, the quantity manufactured is relatively small. General Motors Specifications 4567-M, covering an EP steering-gear grease containing 5 to 6 per cent of calcium soap, is representative of that type; 4641-M is also a special steering-gear grease, but contains no grease base. It is required to stand a load of 24 lb., minimum, on the Almen machine. As an aid to all-year use, the Saybolt viscosities of oils used in both products is specified at 0 as well as at other temperatures. A mixed-base EP steering-gear grease suitable for all seasons except winter will need 6 per cent of calcium base and 2 per cent of sodium base with an oil of Saybolt viscosity of 190-200 at 210 deg. F., and a worked ASTM penetration of 300-330—EP compound to be added to give the above load-carrying capacity on the Almen machine.

Of course, many still give the steering gear a "shot" of pressure-gun grease; but even if a semi-fluid type is used, best lubrication will not be obtained. This will be especially true because of the average long interval before the car is again greased.

Universal-Joint Grease

It can hardly be said that grease - lubricated universal joints have been, as a whole,

TABLE 3

Specifications of Special Type Sodium-Base Grease

Soap Content (Maximum) (Per Cent)	Water (Maximum) (Per Cent)	ASTM Worked Penetration	Dropping Point (Minimum) (Deg. F.)	Texture	Saybolt Viscosity of Oil Content (Minimum)
16	0.5	315-345	320	Extremely tacky	85 at 210° F.
The following covers a combination product referred to above:					
18*	1	235-265	280	Tacky	125 at 210° F.

*12 per cent calcium soap, and balance sodium.

Boiling down the BUDGET

TO YOU EXECUTIVES who are now facing the annual Budget problem we say this—unless yours is a very exceptional case, Fruehauf Trailers will reduce your "Transportation" appropriation 30% to 50%! With Fruehaufs you can do a larger transportation job with the *same* appropriation. Or you can do the same job for *less* money.

HOW IT WORKS FOR YOU

It works out like this. If you couple Fruehauf Semi-Trailers to your *present* sized trucks, you more than double the gallonage hauled per trip — without materially increasing operating expenses. On the other hand, a new tractor-trailer unit, pulling your present gallonage, costs approximately 25% *less* than your trucks of equal capacity—and your delivery cost per gallon is about 38% less. These savings apply equally well whether you are a large or small operator.

WILL YOUR BUDGET STAND THE TEST?

You may honestly believe your Budget report contains the lowest possible figures. But, before it is submitted, make one final check on Fruehauf Trailers. Get our figures. Compare them with your present plans. See for yourself where the difference lies. We are prepared to give you special "budgetary service" which will place an analysis of your operations on your desk quickly. There is no obligation, of course.

Service

FRUEHAUF nation-wide service is just that—*on the spot* service wherever you are. It is never necessary to return a Fruehauf to the factory for repairs. Usually within a few hours, or, in extreme cases, a day or two, your equipment is on the road again.

HERE'S WHAT YOU GET

A SAVING IN FIRST COST. A 1½-ton tractor, used with a Fruehauf Semi-Trailer, will do the work of a 3-ton truck. Naturally, first cost is lower—even after adding the price of the Semi-Trailer.

3-ton truck with tank . $3700.00*
1½-ton tractor-truck with Fruehauf Semi-Trailer and tank . . . $2890.00*
Saving in first cost . . $ 810.00

GREATER OPERATING ECONOMY

The cost of gas, oil, tires, maintenance and depreciation on a 1½-ton tractor averages 38% less than on a 3-ton truck. Maintenance on a Fruehauf is negligible.

MORE FLEXIBLE PERFORMANCE

Tractor-trailer units are "hinged in the middle." They can be turned shorter, parked more easily and generally maneuvered faster than a large "one-piece" unit of equal capacity.

Also, since tractor and Trailer are easily detachable, the Trailer can be "spotted" for loading and unloading while the tractor continues on other work.

** These figures do not represent the most expensive, nor yet the lowest priced, in either motor truck or Trailer. They are a fair average.*

FRUEHAUF TRAILER COMPANY, 10962 Harper Avenue, Detroit

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Engineered In Every Part — *"Engineered Transportation"* — *Engineered To Your Job*

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efficiently lubricated. That is true; because some guns used do not develop enough pressure to handle a universal-joint grease of the proper consistency, or the individual applying is so lazy that a product is wanted which will allow easy operation of the gun.

At the average road speed of today, a tremendous centrifugal force is developed at the universal joint or joints. This means that the lubricating grease must be very high both in cohesion and adhesion. In other words, it must cling closely to the bearing surfaces and at the same time resist being torn apart.

Softer universal-joint grease, which has been demanded by some for reasons stated above, is apt to be thrown—or rather pulled—from the joint by that centrifugal force, with resulting wear. Of course, neglect can also be a contributing factor.

In order to keep down stocks, some companies have used a combination universal-joint and wheel-bearing grease with reasonable success. However, such a product necessarily does not have the extreme stringiness or tackiness needed for the best universal-joint grease.

A special type of sodium-base grease, having a very long fiber, is manufactured for universal-joint grease, and approximate specifications of the finished grease are given in Table 3.

Road-service tests are the best criterion by which to judge serviceability of universal-joint greases.

Water-Pump Grease

Since resistance to emulsion with water is one of the main requisites of this lubricating grease, it is customary to use a calcium base in manufacturing it.

A hard consistency is advisable, as that is an aid in resisting softening by the hot circulating liquid which passes through the pump. However, the grease should not be too hard, since in the case of cup feed it may not pass to the bearings as rapidly as it should.

The characteristics of a serviceable water-pump grease are given in Table 4.

Miscellaneous Lubricating Greases

Several automobile manufacturers are still recommending a cup grease for use on the distributor. Until all go to the use of a short-fiber grease, such as a wheel-bearing grease, it is thus necessary for those greasing all makes of cars to carry a No. 3 cup grease. It should be the regular calcium-base product, and particularly for this purpose it is not necessary in manufacturing the grease to use an oil higher in Saybolt viscosity than 75-100 at 100° F.

The growing use of metal-covered springs is making necessary the stocking of a graphite spring grease when complete lubrication service is offered. It should have a worked penetration of 270 to 290 ASTM. The graphite spring grease that is apparently most efficient should contain 40 to 45 per cent of graphite, but others are being made which contain a much smaller quantity. Some specifications call for amorphous, and others for flake graphite—which must all pass through a 200-mesh sieve.

Progress Has Been Made, and Will Continue

Lubricating-grease manufacturing is far different now from what it was in the early days, when the grease was made in a direct-fired kettle and stirred by hand with a paddle. Now modern kettles, of open and pressure types—with efficient mechanical mixers and temperature control—are in use.

The grease maker no longer uses the finger test to determine the consistency, but depends on the chemist, who checks it by a standard method on an approved apparatus. The latter has previously analyzed the various raw materials as the first insurance of uniformity.

Grease filters are necessary equipment to be sure that only absolutely clean grease is shipped to customers. Can-filling machines not only speed up that operation, but each can is cleanly filled with the exact amount of lubricating grease. Steel drums of various sizes, lithographed if desired, have practically replaced wooden barrels and kegs.

Corrugated-fiber cases have now largely supplanted wood cases, and an automatic sealing machine is helpful in efficiently handling them. Most small shipments are made by truck now rather than by railroad.

Grease chemists have already done excellent research, which has resulted in the production of better lubricating greases than have ever been available before. That work will be continued, so that eventually we shall have the needed fundamental knowledge to come closer to answering the question: "What is lubricating grease?"

More standard methods are needed for laboratory control of lubricating greases, both by manufacturers and consumers. Sub-committee IV of ASTM Committee D-2 is actively engaged in that work. Present cooperative study and experiment are largely on methods for softening points of lubricating greases under heat and consistency of very soft products.

The National Association of Lubricating Grease Manufacturers is already functioning in a way that will be an immeasurable help in future progress of this industry.

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TABLE 4

Characteristics of a Serviceable Water-Pump Grease

Calcium Soap Base (Maximum) (Per Cent)	Water (Maximum) (Per Cent)	ASTM Worked Penetration	Dropping Point (Minimum) (Deg. F.)	Saybolt Viscosity of Oil Content (Minimum)	Color of Oil
24	1	160-190	210	100 at 100° F.	3 ASTM

ADVERTISING PAGES REMOVED

AFTER The new Indianapolis station of the National Refining Co. The exterior surface is faced with carrara glass

Modernization of Indianapolis Station Brings 300% Business Increase

By John W. Thompson
N. P. N. Staff Writer

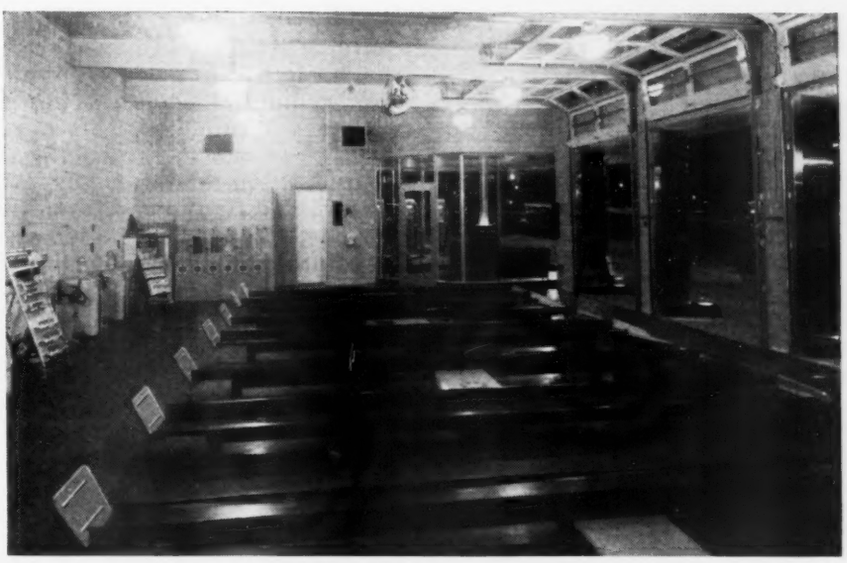
WITH so many oil companies experiencing business increases through station modernization and improvement, it is becoming rather trite to continue to point out that fact. However, the outstanding success at one of the Indianapolis stations of the National Refining Co. as a result of rebuilding cannot go unheralded. Nor can the new station itself.

On a lot measuring 150 by 190 feet, at the intersection of 25th St. and Meridan, one of National's old type stations has been doing business for a number of years. Two covered pump islands, separated by the station office served the gasoline customers. A separate building contained the greasing pits.

When modernization struck this layout, it struck with a vengeance. In the process of changing over, only the location of the curb cuts remained. It was as if a huge shovel had scooped up everything on the site. Even a few inches of the ground surface was removed also, to lower the level of the station drives so that they would be the same height as the crown of the street.

Just a few weeks ago the new station opened its four lubrication bays and two conveniently located pump islands, amid the astonished "ohs and ahs" of the people of Indianapolis. National Refining officials caught many figurative bouquets tossed at them by impressed Hoosiers.

Naturally it was expected that business would pick up as a result of this brilliant new station. However, to expect that business would merely pick up was putting it mildly, for it was not many hours after the open-



The lubritorium of the new National Refining Co.'s Indianapolis station. The walls are a cream colored tile. All greasing equipment is portable

BEFORE The National Refining Co. station in Indianapolis as it appeared before the modernization plans were undertaken

ing until the cash register was singing a pleasing tune of a 300 per cent increase in business. The same tune is still being played as this is written.

The exterior of the station is faced with carrara glass. Each bay is provided with an overhead door, completely paneled with glass. Between the bays are protruding V-shaped stainless steel panels. An octagon-shaped waiting room and office is located at one corner of the building. It extends out into the drive slightly and is completely enclosed by glass walls from ceiling to floor.

As one enters this room from the drive he faces a full length mirror which is located opposite the door. It has been discovered that the station attendants, upon entering the room, seldom fail to look in the mirror and adjust a tie or improve their appearance in some way.

At the opposite end of the lubritorium from this waiting room a full length plate glass window has been inserted into the wall. Vital statistics on this station reveal that 7½ tons of glass were used in its construction.

On the inside of the lubritorium the rear wall is faced with cream colored tile. Portable greasing equipment is symmetrically lined up against the back wall. The ceiling is finished in natural wood. Air reels are located on the ceiling. Under each of the four drive-on lifts there are two flood lights set in flush with the floor.

In one corner of the lubritorium is a small tile covered room in which there is shelving to take care of the immediate wants of the attendants. A wash stand and toilet are also in this room for the use of attendants. Leading from this room are stairs to the basement where are located the air compressors, oil furnace, refrigeration unit for the water fountain, lockers for attendants, and a shower.

Rest room accommodations for men and women are neat and modern. The ladies room is equipped with extra equipment such as a vanity dressing table, and a bench.

Heat for the station is provided through two unit heaters —one for the waiting room and rest rooms, and the other for the lubritorium.

Returning to the outside of the building, the canopy which runs around the top is trimmed with aluminum. Directly over the station waiting room rises a 24-foot pylon made of porcelain enamel and trimmed with stainless steel. At night the lettered porcelain panels are brilliantly reflected and the ball at the top becomes an effective beacon light for motorists in sarch of a service station. Flood lights from four locations play down on the white glass walls of the station and at one end there is a flood light at the ground level which casts a picturesque shadow of the bordering shrubbery against the wall of the station.

Over 90 evergreens have been planted about the station property to give it an appearance in harmony with the surrounding landscape. Around the curbing on the outside corners of the octagon-shaped waiting room there are flood lights flush with the curb level. In the center of the waiting room a table-height dish-shaped reflector casts an indirect light over the entire room by reflecting it against the ceiling.

The two pump islands each have two island lights. An island is parallel to each street, with four cash recording pumps being located on one and three on the other. Air and water hoses are provided at the base of each island, with the reels being below the surface and out of sight. Alcohol is available at one of the islands through a hose which is fed from an alcohol tank into which is forced air pressure.

Space is available in the rear of the station property for a wash rack. The company plans to make this addition in the spring.

Proration Hearing Called

AUSTIN, Tex., Nov. 9.—The Texas Railroad Commission has issued an order for a hearing at Austin Nov. 19 to receive nominations for oil to be used, produced and/or purchased during December. The order also asks for nominations from purchasers of gas.

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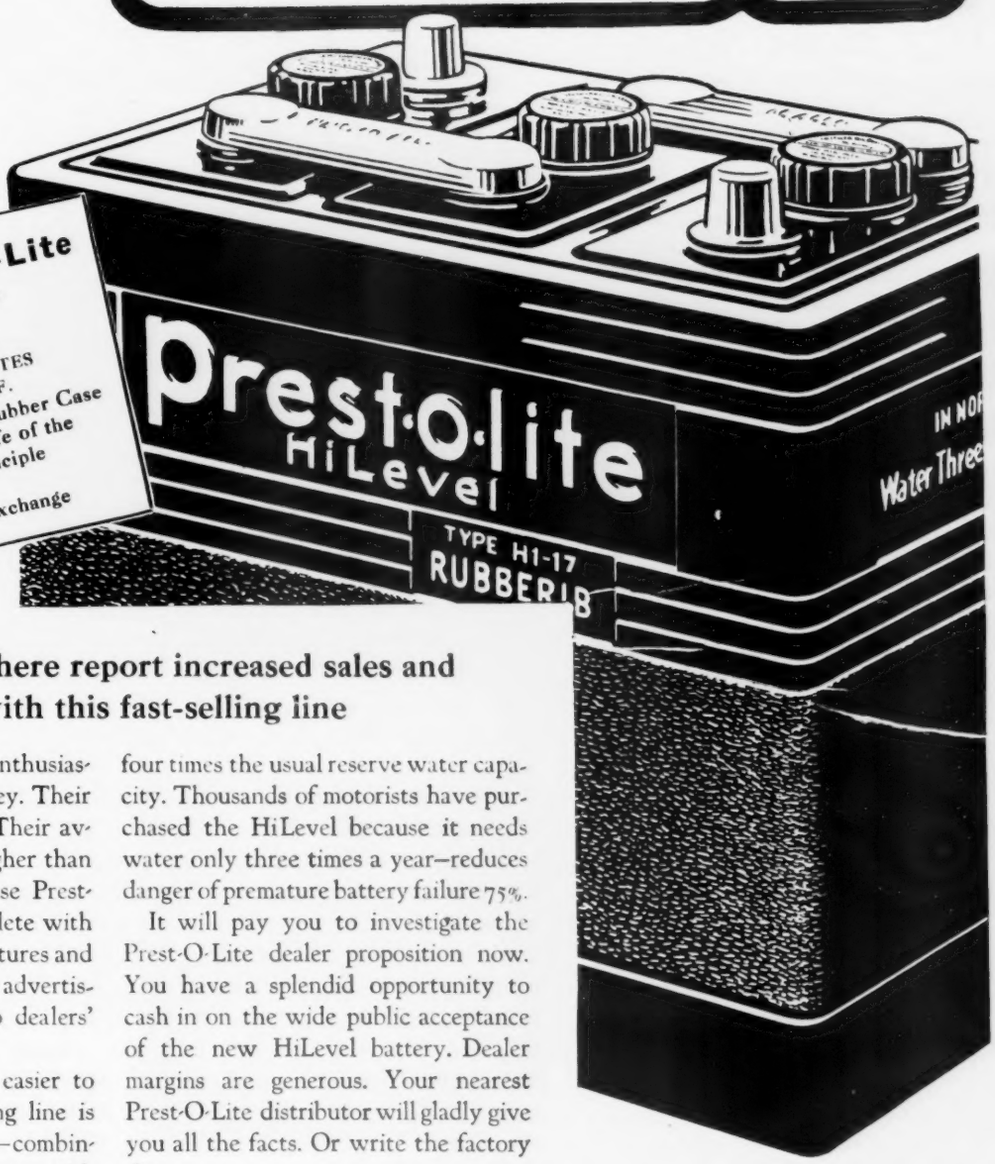
3.7 MINUTES at ZERO F.
Rubberib Separators—Hard Rubber Case
Convenience and longer life of the exclusive HiLevel principle
Retails for only **$12.45** exchange



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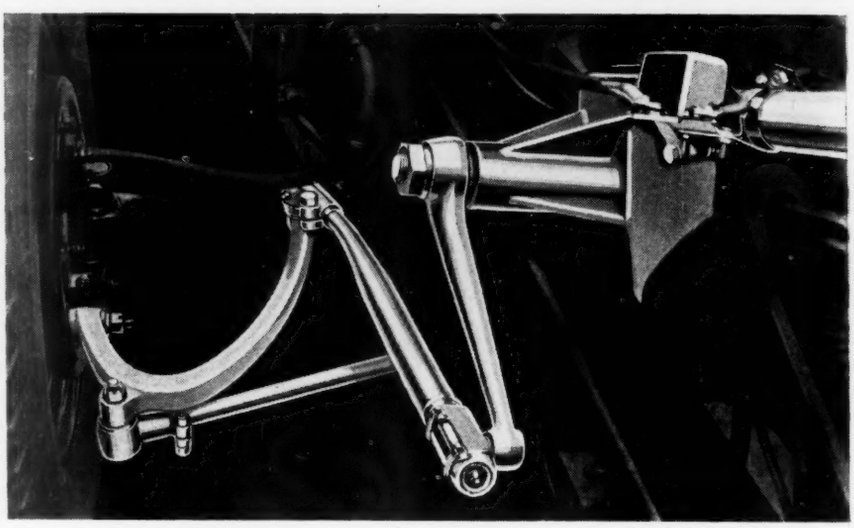
1936 Plymouth Reveals Few Lubrication Changes



The new steering design on the 1936 Plymouth. Front springs are shackled at the front instead of at the rear as in the previous model

By John W. Thompson
N. P. N. Staff Writer

PLYMOUTH, emerging from a very successful sales year on 1935 models, is making no major changes in 1936 models. The new Plymouths will feature such improvements as:

(1) The rubber - cushioned body, with rubber shims placed between the body and the frame. Plymouth this year will use over 40 pounds of rubber, in more than 400 points on the car, as insulating material.

(2) Improved steering by mounting the front springs with the shackles at the front instead of the rear, and by the addition of a steering-shock eliminator at the rear of the left front spring. The ride stabilizer is mounted on the shock absorber arms instead of being attached to the tubular front axle as in the past. With the shift in front shackle location, the drag link of the new steering system now moves in the car's line of travel. The axle movement now follows the arc of a circle with the center of the circle at the rear of the front spring mounting. Thus the arc described by the axle is practically the same as that described by the forward end of the drag link, making the steering system more efficient.

The wheelbase of the new model remains the same, 113 inches. The engine is similar to last year's, with 82 horsepower, 6.7 to 1 compression ratio, full length water jackets, directional water circulation, and calibrated ignition. Hydraulic brakes are, of course, continued.

The car has been lowered an inch on over-all height, and bodies give 4½ inches more passenger space lengthwise and about 2 inches more elbow and shoulder room. The rigidity of the frame has been doubled without adding any excess weight, and the cross-member intersection has been made into a one-piece barrel-shaped section, instead of the two-piece type formerly used.

With the exception of relocation of points, minor specification changes, and mileage changes, the lubrication requirements are quite similar to the previous model. Shifting the front spring shackles now places 2 pressure fittings at the front of each front spring. The rear of the right front spring now has one fitting, and the rear of the left front spring, where the shock eliminator is located, has 2 fittings. One fitting is now provided on each front shock absorber linkage.

The new steering shock eliminator, or kick shackle, located on the rear end of the 1936 Plymouth's left front spring. This shackle prevents road shocks from being transmitted to the steering wheel

The steering drag link, which formerly was located parallel with the front axle, is now perpendicular to it and has a pressure fitting on each end. A semi-fluid chassis lubricant is specified for all the points mentioned above. Front ends of the rear springs are attached to the frame by rubber bushed spring bolts which require no lubrication.

Two new pressure fittings are added to the pedal shaft this year in addition to the lubrication of the linkage with engine oil. The clutch release bearing, which requires a medium short fibre grease, is fitted with a grease cup and requires a turn every 6000 miles, just as on the previous model. It is recommended that the filter cartridge be replaced every 8000 miles, instead of at 10,000-mile intervals as last year.

As in the previous model, the crankcase capacity is 5 quarts, and an oil change is recommended every 1500 miles in summer and every 1000 miles in winter. For normal operating conditions in summer an S. A. E. 30 oil is recommended

(*Continued on page* 74)

ADVERTISING PAGES REMOVED

• MARKETS •

CLEVELAND, Nov. 11

OIL markets east of the rockies more than held their own against the normal seasonal trend in the week ended Nov. 9. Crude prices were advanced in Michigan, wholesale and retail gasoline prices worked higher in some sections, and most reports indicated that consumption was at record levels.

Most observers were optimistic as to the market outlook, and many were predicting that the usual seasonal decline in gasoline prices would fail to materialize. There were, however, some signs that indicated possible trouble ahead. This was due to a surplus of low octane gasoline in some districts.

The market on the west coast was improved, although there were several problems still to be threshed out. All the major purchasers of California crude were posting approximately the same prices posted by Standard of California on Nov. 1. The only differences were in the higher and lower gravities in some fields.

For the first time since Sept. 30, 1933, Pure Oil Co. advanced Michigan crude prices 10 cents to $1.12. Simrall Pipe Line Corp. followed with a similar advance. No formal announcement was made as to the reason for the advance. Traders generally believed that it was due to the increase in demand. Demand has probably increased faster than production. Production of Michigan crude in September averaged 48,300 barrels daily, exceeding Pennsylvania's production by about 5600 barrels daily.

Virtually all suppliers advanced wholesale and retail gasoline prices in eastern New York state and New England. It was the first advance in that territory since last May. It fulfilled predictions made by many traders in that territory for several weeks. A general advance of that type in the first week of November is unusual.

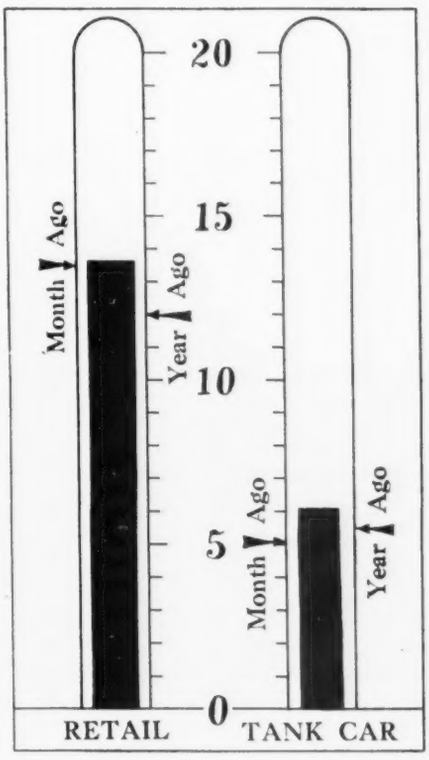
Although the advance in tank car and barge prices was 0.25 cent, the retail advance varied from no change at points where prices are subnormal to 0.8 cent at some points. Standard of Louisiana advanced retail prices 0.5 cent throughout Tennessee.

NATIONAL PETROLEUM NEWS retail gasoline index for 50 cities advanced 0.04 cent to 13.6 cents. Last year when the industry was involved in a price war, the same index of retail prices stood at 12 cents. Similarly the tank car weighted average is now 6.03 cents against 5.48 cents a year ago.

That consumption is higher this year is advanced by some traders as the reason there is not the price wars there were last year. However, there seems to be some proof in present conditions that gallonage does not depend on a cut price.

N. P. N. Gasoline Index

(Copyright)



Retail index of 50 cities, ex-tax, and tank car is a weighted average of 13 wholesale markets for middle octane gasoline. The gasoline price index this week represents the following prices in cents per gallon:

Date	Retail	Tank Car
Nov. 11	13.60	6.03
Month ago	13.53	5.11
Year ago	12.00	5.51

A good share of the reason for the advances along the eastern seaboard is the recent increase in cost of transporting petroleum products from the Gulf coast to the eastern seaboard. The heavy movement of products to foreign countries combined with the increased consumption on the eastern seaboard has so increased the demand for boats that they have become scarce.

Naturally the scarcity of boats has resulted in an increase in their rates. Therefore, the margin for profit between Gulf and seaboard prices which was already narrow, has been almost wiped out.

Both finished and bulk motor fuel stocks increased the last week of October. However, it was the first increase since late in September. Stocks remain below the levels of last year despite the fact crude runs are about 200,000 barrels daily over last year's average.

The recent unseasonably warm weather in almost every section of the country has been a boon to gasoline consumption. Just how well the present price structure can be maintained apparently depends upon the industry's ability to curtail crude runs when bad weather finally arrives to cut into consumption.

Some traders point to the steady movement of gasoline to foreign countries and predict that offerings of gasoline will be scarce throughout the winter.

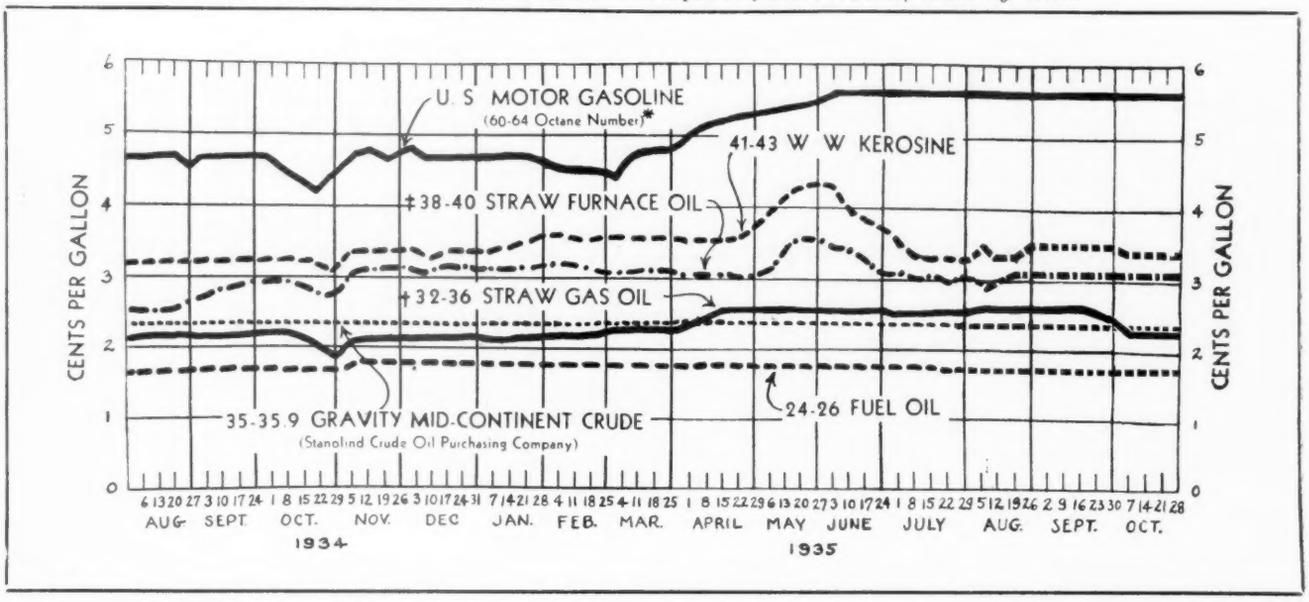
Other traders, however, point to the surplus of third grade gasoline which is already causing uneasiness in some districts. Unfortunately it apparently takes but a small percentage of the total movement to upset a price structure.

When Standard of California advanced its crude prices it also advanced its wholesale and retail gasoline prices. The company believes that high crude prices cannot be maintained unless refined products can be sold at correspondingly good prices.

A threat to the higher gasoline prices lies in the large quantity of gasoline, made from low priced crude, which is hanging over the market. Upon the method by which this gasoline is marketed depends the stability of west coast markets.

Barometer of Mid-Continent Refinery Market

Charted Course of Prices of ***Crude and Principal Refined Products, Week by Week***


U. S MOTOR GASOLINE
(60-64 Octane Number)*
41-43 W W KEROSINE
‡38-40 STRAW FURNACE OIL
†32-36 STRAW GAS OIL
35-35.9 GRAVITY MID-CONTINENT CRUDE
(Stanolind Crude Oil Purchasing Company)
24-26 FUEL OIL
CENTS PER GALLON
CENTS PER GALLON
AUG. SEPT. OCT. NOV. DEC JAN. FEB. MAR. APRIL MAY JUNE JULY AUG. SEPT. OCT.
1934
1935

***Changed to 63-70 Octane Number Aug. 6, 1934. †32-36 straw gas oil changed to U. G. I. gas oil, and 38-40 straw furnace oil changed to No. 1 straw (38-40 grav.), Jan. 7, 1935.**

Coastal

Gasoline Tight

NEW YORK, Nov. 9

HIGHER gasoline quotations prevailed in some quarters of the Gulf Coast cargo market during the week ended Nov. 9. Other suppliers made no change in prices but said that there was no surplus available and no weakness apparent.

Export gasoline buyers again stayed out of the market but as few cargoes were available the lack of inquiries had little effect on the market. Most of the independent refiners who have been bidding for foreign business reported they would be unable to quote even on a firm offer. One supplier said he had a cargo of 64-66, 375 e.p. gasoline but was in no hurry to sell and was holding for higher prices. Quotations for this grade nominally were at 5.5 cents in most quarters.

Reports of efforts of Italians to purchase petroleum products continued to be heard, but most of the suppliers who had been making quotations said they were unable to obtain any business and doubted the movement of any considerable quantity to the Italians from the American Gulf. Some sales undoubtedly were being made, it was said, but not in the quantities which reports have credited to American suppliers. Definite information as to sales and inquiries was hard to obtain.

Reports that the Italian government was attempting to purchase 50,000,000 barrels of crude oil from the East Texas field were freely heard, but New York traders said they thought the amount was entirely out of line with any purchase that could be made. Even the large companies would be unable to supply crude in quantities that large, it was thought.

Gulf gasoline for coastwise movement also was tightly held and several suppliers advanced their prices. Quotations of 5.625 and 5.75 cents for 65 octane gasoline were heard in some quarters, but 5.5 cents continued to be the most generally quoted price. Difficulty of obtaining boats for prompt loading also tended to keep the Gulf market in a tight position.

Other products at the Gulf were steady as to price with demand showing some improvement.

Wax

Prices Higher

NEW YORK, Nov. 9.—Conditions in the scale wax market continued to show improvement and prices were at higher levels during the week ended Nov. 9. Both buyers and suppliers reported that no scale was available for fairly prompt delivery at under 2.25 cents a pound, and some suppliers said they were getting up to 2.35 cents.

Demand remained at a fairly good level, both for domestic and export shipment. Manufacturers generally reported that their stocks were reasonable and that demand seemed to be in good balance with supplies.

The market for refined waxes continued on an even keel. Demand was consistent and stocks were in good shape, it appeared. No price changes were reported.

Eastern

Gasoline Prices Up

NEW YORK, Nov. 9

GASOLINE prices, both tank car and service station, were advanced throughout the New York and New England portions of the Atlantic seaboard during the week ended Nov. 9. The advance followed a period of excellent off-season consumption.

The advances in retail prices generally ranged from 0.1 to 0.8 cents a gallon, although no changes were reported at some points where prices are sub-normal. The advances in tank car markets, both terminal and consumer, were 0.25 cent a gallon.

Gasoline markets along the eastern seaboard have been gradually growing tighter the past few weeks, despite the fact this is normally the period when the market turns easier as the result of lessened consumption. However, demand has been reported remarkably good this fall, lacking the sharp decline of previous years. Excellent motoring weather throughout most sections of the east contributed largely to this good demand, traders said.

Independent suppliers of gasoline from eastern seaboard terminals have complained for several weeks of their inability to obtain enough gasoline to supply their requirements, even though confining sales to regular customers. Jobbers also reported this tightness in the tank and barge markets, although generally they were buying on contract and were protected for their supplies.

A number of the independent group

advanced their tank car and barge prices 0.25 cent at New York harbor during the week ended Nov. 2, but it was not until Nov. 7 that the advances were followed by virtually all other suppliers at the harbor. Prices also were advanced in the Boston district at the same time, and later in the week at Providence.

Following the advances, the tank car market for gasoline at these three points was firmly held at 6.5 cents for 65 octane and above and 6.25 cents for the 60-64 octane grade. Barge prices were 0.25 cent lower than tank car.

Kerosine markets seemed to be on an even keel all week, following the 0.25 cent advance late in the previous week at northern seaboard points. Demand was not particularly heavy, but suppliers apparently were holding out for the higher price levels.

Mid-Continent

Natural Higher

TULSA, Nov. 9

THE fine balance between supply and demand for Mid-Continent gasoline of the past few months was disturbed somewhat the early part of the week by increased offerings. Inclement weather during the first week of November took the edge off demand. As a result there was gasoline available for immediate shipment from several refinery areas. These offerings consisted mostly of low octane grades and were limited to five and 10-car lots.

East Texas gasoline was obtainable in the Chicago marketing area for a short time during the week. In most instances however it was obtainable only at existing prices. Some resale agents, however, claimed they could buy scattered cars of U. S. Motor in East Texas at 4.5 cents on a Group 3 freight basis. The volume thus offered was insignificant and by the latter part of the week almost nonexistent. The 400 end point gasoline was selling at 4.625 to 4.75 cents to resale accounts early in the week. Later, brokers complained they were unable to purchase supplies in East Texas at prices that enabled them to sell at a profit. This indicated that supplies no longer were plentiful and the resale and jobber price differentials again were narrow.

Supplies of gasoline from other Mid-Continent districts were closely held during most of the week. There was a day or two when occasional offerings were encountered in the open market. For the most part gasoline had firmed up by the end of the week. Prices showed little change over last week.

Inquiry for high octane gasoline was brisker. High gravity motor fuel also was receiving more attention from northern jobbers. This interest in high gravity gasoline was attributed to the need of a quick-starting and volatile gasoline for winter use.

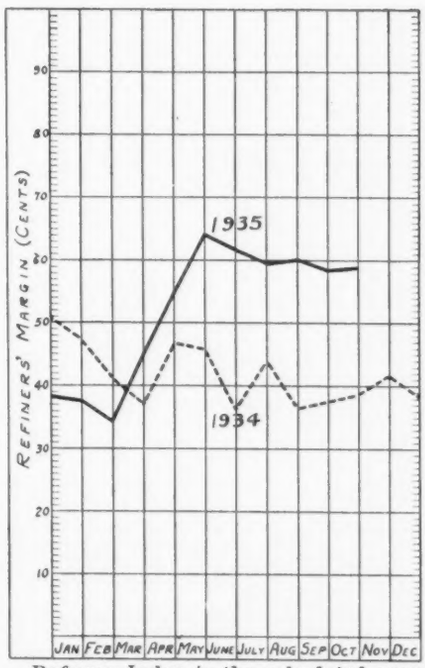
Natural gasoline prices took a turn for the better the past week. Prices were 0.125 cent higher than a week ago as a direct result of a temporary shortage and increased buying for immediate shipment. The shortage of natural during the first week of the month developed when contract as well as open market purchasers increased their takings. Movement of Mid-Continent kerosine was sluggish in most districts. Since refiners were pushing the sale of their "heating oils," the production of kerosine has been curtailed. Curtailed production has brought supplies down to the level of demand. North Texas refiners were short on kerosine for local shipment. Since most of their kerosine moves within the state, they were able to obtain higher prices for their product.

Buyers were purchasing their wax requirements at 2.25 cents f.o.b. Mid-Continent plants. They were having difficulty finding sufficient wax to cover their needs as most manufacturers were sold up. Some sales were reported at higher prices.

A change in the marketing policies of Mid-Continent neutral oil manufacturers has been reflected in NATIONAL PETROLEUM NEWS' method of quoting these oils. It is general practice now to quote Mid-Continent neutrals as red and pale oils. Formerly, neutral oils were marketed as Nos. 2, 3, 4 and 5 color oils. Intermediate viscous oils —No. 4 color—now are quoted 0.5 cent above red oil prices. Slight revisions in prices of the high viscosity oils were reported.

Bright stocks were tightly held Prices were steady.

N. P. N. Refinery Index



Refinery Index is the calculated average return from refining a barrel of 36 *gravity Mid-Continent crude. The Index this month indicates the following margins in cents per barrel between cost of crude and selling price of products.* (*See N.P.N., Aug.* 28, *p.* 26):

Date	Margin
Nov. 4	58.9
Month ago	58.5
Year ago	38.7

California

Crude Stabilized

LOS ANGELES, Nov. 8

DEVELOPMENTS during the week included acceptance by all major purchasing companies of the crude price schedule posted by Standard Oil Co. of California, Nov. 1. Little progress, however, was made toward stability of refined products on Pacific Coast markets.

The chief threat consisted of large accumulations of competitive brands of gasoline that independent refiners had manufactured from oil produced or purchased during the period of reduced crude prices.

Although efforts were being made to absorb this excess gasoline, no satisfactory means had been found and marketing officials feared that unless prompt action were taken wholesale and retail gasoline prices might lose some of the ground gained last week. Failure of secondary companies to keep their retail outlets in line with established prices for major third-grade products, added to the seriousness of the situation.

Major company third-grade brands of gasoline, delivered by tank wagon to points in the Los Angeles Basin area, were nominally quoted at 11.5 cents a gallon, inclusive of 4 cents tax, and with a 1-cent margin to 100 per cent accounts. Independent competitive brands, which were retailing at 1 cent per gallon less than major company third-grade brands, were posted at 10 cents a gallon for tank wagon deliveries in the same area.

These prices, however, were not well maintained and considerable quantities of competitive brands of gasoline could be bought at 9 cents a gallon for deliveries within the state and for 8.75 cents for outside state shipments.

Natural gasoline prices ranged from 5 to 5.5 cents a gallon, delivered at refineries, but higher prices were expected to result from increased demand when attempts were made to market the gasoline that has accumulated during the past two months at independent plants in the Basin area.

Quotations on fuel and diesel oils were notably irregular, especially in

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BULK STORAGE AT LOS ANGELES HARBOR AND OAKLAND, CALIFORNIA

the Los Angeles harbor district, and for export. Diesel oil, above 23.9 gravity, was quoted at $1.125 to $1.15 a barrel for ships' bunkers, or deep tank lots. Similar shipments of grade C fuel oil were quoted at $0.825 to $0.85 a barrel. In cargo lots, diesel oil, above 23.9 gravity, was offered at $1.10 to $1.15 a barrel.

Prices of gasoline on Pacific Coast seaboard markets were firm with some advances registered. A 40,000-drum shipment of 65 octane, 400 e.p. blend gasoline was reported booked for export within the next two weeks to an Italian Somaliland port. The price was understood to be about 6 cents a gallon, which was somewhat higher than prevailing quotations for normal spot shipments.

Pennsylvania

Demand Steady

CLEVELAND, Nov. 9

A FAIRLY good inventory position was maintained by most products in the Pennsylvania market the week ended Nov. 9 as demand remained steady. U. S. Motor gasoline and fuel were up 0.125 cent on increased activity, and cylinder stocks were firmer as a result of better demand.

The recent 0.25-cent advance in 65 octane gasoline prices has tended to increase the demand for low octane gasoline for reforming and blending purposes. More refiners were blending or reforming the low octane gasoline in order to supply the demand for the higher octanes. This demand, combined with the better than seasonal jobber demand for low octane due to the unusually warm weather, has reduced the recent surplus of U. S. Motor, according to trade reports. As the status of U. S. Motor improved during the week, virtually all refiners advanced their prices to a minimum of 5.25 cents.

Reports from some quarters indicated, however, that a few cars of low octane were available at slightly lower prices, but it was said that the volume was not sufficient to be representative of the market.

Fuel oil became rather scarce last week. Despite the fact that the usual seasonal demand for furnace oil was lacking, a steady demand for fuel oil for cracking purposes, and for use in industrial plants took just about the whole month's production of several plants. This reduced the volume of fuel oil available for spot shipment. Refiners with fuel oil to ship, therefore, were asking and getting higher prices.

The dark stocks took a turn for the better. They have been the easiest item on the list for some time. A more active demand tended to firm prices,

although no definite change was noted. While 600 steam refined was in better demand, 600 flash and 650 steam refined were getting the most play. Much of this demand was from foreign quarters, traders reported.

Bright stock remained firm, although it was not as active as it was two or three weeks ago. Much of the demand was for the lower pour test material. Some traders reported considerable difficulty in obtaining 10 pour test bright. Only a few plants were manufacturing 10 pour test, and most of it was sold on a contract basis.

The unusually warm weather has reduced somewhat, the brisk demand for neutrals. Inventories remained low, however, and some traders were still predicting a shortage of neutrals before the end of the year.

The higher octane gasolines still were in good demand. It was due largely to this steady demand that kerosine, fuel oil, and U. S. Motor were in good position.

The warm weather was curtailing the jobber demand for kerosine, but a large volume of kerosine-distillate was moving to the cracking plants. This reduced the volume of finished kerosine offered on the open market.

Wax prices moved up slightly. Buyers were still active and in most instances paid sellers' prices without complaint.

Chicago

Gasoline Freer

CHICAGO, Nov. 9

WHILE no price change was apparent in the Mid-Western tank car gasoline market the week ended Nov. 9, the offerings were slightly easier. The open market failed to absorb current offerings.

At the end of the week, however, gasoline prices continued to hold tenaciously to the 4.75-cent minimum for low octane U. S. Motor gasoline.

The uncertain weather which has been prevailing over much of the middle west has left its mark on open market buying of gasoline, sellers indicated, although the slack was confined to third-grade offerings. The market for the higher octane grades of gasoline ruled tight.

No change was apparent in the retail gasoline price situation throughout the Indiana Standard territory the past week. Several important points continued below the normal price structure.

Kerosine was listless in the Mid-Western tank car market. Despite an apparent lack of interest on the part of most traders, prices for the 41-43 w.w. and 42-44 w.w. grades were steady throughout the week.

Michigan Jobbers Ratify Action Of National Association

GRAND RAPIDS, Nov. 7

Michigan independent oil jobbers at a two-day meeting Nov. 5 and 6 at the Pantlind hotel here backed the stand taken by the National Oil Marketers Association at Chicago Oct. 31.

Michigan jobbers ratified the resolution adopted at the Chicago convention calling upon Attorney General Homer S. Cummings to find out if alleged secret agreements in violation of the anti-trust laws are in existence. The Michigan resolution was extended to include the current legislative investigation in that state.

A committee of jobbers will ask Governor Fitzgerald of Michigan to co-operate in furthering the legislative oil marketing inquiry. This committee also will request that Gorden E. Tappan, assistant attorney general, be given authority, and freedom from other duties to carry the investigation to a conclusion. It was also proposed that Mr. Tappan be given a staff to make necessary investigations.

Michigan jobbers also endorsed and supported the national association's resolution on fundamental marketing policies demanded before consideration of any proposed voluntary oil code.

Roy R. Fisher, Argo Oil Corp., Detroit, and vice-president of the national association, discussed the work accomplished at the recent national convention. He charged major oil companies with conspiracy to violate federal anti-trust laws.

Paul E. Hadlick, Washington, secretary of the Nattional Oil Marketers Ass'n., reiterated the position outlined by his organization on the matter of jobbers' margins. He pointed out that they have not asked for longer margins which would raise the price of gasoline to the public, but "an equality of opportunity", by having refiners conduct their marketing operations on the same basis they allow independent jobbers. Mr. Hadlick pointed out that if this were accomplished, high cost outlets would be closed causing a redistribution of gallonage but all would then be on an equal basis.

Senator Joseph A. Baldwin, chairman of the legislative committee investigating oil marketing in Michigan, spoke on the origin and present status of the investigation. Mr. Baldwin scored chain systems and their absentee control, and impressed upon jobbers the need for a united front. Hazen J. Hatch, counsel for independents pushing the legislative inquiry, also discussed the investigation.

Neil Stabler, Stabler Oil Co., Ann Arbor; John J. Cox, Michigamme Oil Co., Ann Arbor, and Galen Wilson, Franklin Oil Co., Saginaw, were speakers at the Nov. 5 meeting.

J. F. Wilson, Star Oil Co., Port Huron, was re-elected president of the association at the Wednesday session. Roy R. Fisher, was named vice-president and director. Glen E. Pulver, Pulver Oil Co., Lansing, was re-elected secretary - treasurer. Charles Goff, Lansing, was reappointed executive secretary.

Mr. Fisher was the only new director appointed. Holdover directors include V. J. Kahler, Kahler & Friend, Petoskey; H. N. Merritt, Peerless Petroleum Co., Bay City; J. A. May, Community Oil Co., Charlotte; and J. H. Kelly, Jackson Oil Co., Jackson.

Objections to the new law, enacted by last session of the Michigan legislature, requiring oil companies to post a surety bond to insure payment of gasoline taxes were voiced by Galen Wilson. It was pointed out from the floor that Michigan has an extremely high rate of gasoline tax collections, and that the surety bond legislation was "something put over by the bond lobbyists." This law, which becomes effective Jan. 1, 1936, provides for a minimum surety bond of $1000 and a maximum of $25,000. Jobbers authorized J. F. Wilson, president of the association, to appoint a committee to study the new law. Talk from the floor indicated that jobbers were anxious to test the constitutionality of the surety law.

Lion Buys Marketing Properties

By Teletype

EL DORADO, Ark., Nov. 11.—The Arkansas marketing properties of the Marathon Oil Co. have been purchased by the Lion Oil Sales Co. Announcement of the purchase was made by Col. T. H. Barton, president of the Lion interests. The transaction involves the entire marketing facilities of Marathon in Arkansas.

The properties are located in Arkadelphia, Batesville, Conway, DeQueen, Fordyce, Forrest City, Harrison, Jonesboro, Little Rock, Magnolia, Morrilton, Paris, Russellville, Searcy, Stuttgart, Texarkana, Prescott, Pine Bluff, Paragould, Fayetteville, Fort Smith, Hot Springs, Berryville, Blytheville, Booneville, Clarksville, Malden, Mo., Marianna, Mena, Rogers and Walnut Ridge.

REFINERY TANK CAR MARKETS

Prices in cents per gallon, tank car lots, except where otherwise noted. Prices are those to domestic jobbers who resell to consumers They do not represent inter-refinery sales, or sales for export. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude.

Gasoline *and* Naphtha

	Nov. 11	Nov. 4	Oct. 28
Oklahoma			
48-54, 450 e.p. naphtha....	4.625– 4.75	4.625– 4.75	4.625– 4.75
U. S. Motor gasoline, by octane numbers:			
62 and below (3rd grade)	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
63-70 octane (regular)..	5.625– 5.75	5.625– 5.75	5.625– 5.75
71 and above.....	.....	.....	.....
60-62, 400 e.p. gasoline....	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
64-66, 375 e.p. gasoline....	4.875– 5.00	4.875– 5.00	4.875– 5.00
68-70, 350-360 e.p. gasoline	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125
Western Penna. (Quotations and /or sales prices to car unloaders)			
Bradford-Warren:			
52-54 naphtha.....	5.125– 5.25	5.00 – 5.125	5.00 – 5.125
Motor gasoline:			
U. S. Motor (58-62°)...	5.25 – 5.375	5.125– 5.25	5.125– 5.25
Minimum 60 octane....	6.75 – 6.875	6.75 – 6.875	6.625– 6.75
Minimum 65 octane....	7.00 – 7.125	7.00 – 7.125	6.875– 7.00
Minimum 70 octane....	.....	.....	.....
64-66, 390 e.p. gasoline....	5.375– 5.50	5.375– 5.50	5.375– 5.50
68-70, 350-360 e.p. gasoline	5.625– 5.75	5.625– 5.75	5.625– 5.75
Other districts:			
52-54 naphtha.....	5.125– 5.25	5.00 – 5.125	5.00 – 5.125
54-56 naphtha.....	5.25 – 5.375	5.125– 5.25	5.125– 5.25
Motor gasoline:			
U. S. Motor (58-62°)....	5.25 – 5.375	5.125– 5.25	5.125– 5.25
Minimum 60 octane....	6.75 – 6.875	6.75 – 6.875	6.625– 6.75
Minimum 65 octane....	7.00 – 7.125	7.00 – 7.125	6.875– 7.00
Minimum 70 octane....	.....	.....	.....
64-66, 390 e.p. gasoline....	5.375– 5.50	5.375– 5.50	5.375– 5.50
68-70, 350-360 e.p. gasoline	5.625– 5.75	5.625– 5.75	5.625– 5.75
California (3c tax to be added to prices if used in state)			
54-58 U. S. Motor, 437 e.p. for in-state shipment....	5.00 – 6.50	5.50 – 7.00	3.50 – 5.00
54-58 U. S. Motor, 437 e.p. for outside state shipment	4.75 – 6.50	5.50 – 7.00	3.50 – 5.00
58-61,375-400e.p.gasoline, 65 octane and above....	7.00 – 8.00	7.50 – 8.50	5.50 – 6.50
†***North Texas*** (F.o.b. Wichita Falls district for shipment to Texas and New Mexico destinations; Group 3 prices quoted on northern shipments).			
U. S. Motor gasoline, by octane numbers:			
62 and below (3rd grade)	4.75	4.75	4.75
63-70 octane (regular)..	5.625	5.625	5.625
71 and above.....	.....	.....	.....
60-62, 400 e.p. gasoline....	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
64-66, 375 e.p. gasoline....	4.875– 5.00	4.875– 5.00	4.875– 5.00
68-70, 350-360 e.p. gasoline	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125
Kansas (F. o. b. refinery, Kansas destination)			
U. S. Motor gasoline, by octane numbers:			
62 and below (3rd grade)	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125
63-70 octane (regular)..	5.875– 6.00	5.875– 6.00	5.875– 6.00
71 and above.....	.....	.....	.....
60-62, 400 e.p. gasoline....	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125
†***West Texas and New Mexico*** (F. o. b. W. Texas and N. Mex. refinery for unrestricted shipment)			
U. S. Motor gasoline, by octane numbers:			
62 and below (3rd grade)	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
63-70 octane (regular)..	5.625– 5.75	5.625– 5.75	5.625– 5.75
71 and above.....	.....	.....	.....
†***East Texas*** (F. o. b. East Texas refinery for unrestricted shipment)			
U. S. Motor gasoline, by octane numbers:			
62 and below (3rd grade)	4.625– 4.75	4.625– 4.75	4.625– 4.75
63-70 octane (regular)..	.....	.....	.....
71 and above.....	.....	.....	.....
60-62, 400 e.p. gasoline....	4.75	4.75	4.75
North Louisiana (For Louisiana and Arkansas destination)			
U. S. Motor gasoline:			
62 octane and below....	5.50	5.50	5.50
63-70 octane number....	6.25	6.25	6.25
71 octane and above....	.....	.....	.....
Arkansas (For Arkansas and Louisiana destination)			
U. S. Motor gasoline:			
62 octane and below....	5.50	5.50	5.50
63-70 octane number....	6.25	6.25	6.25
71 octane and above....	.....	.....	.....

•Nominal. †Refiners generally receive from 0.25c to 0.5c per gallon more for gasoline and kerosine for local or differential territory shipment.

	Nov. 11	Nov. 4	Oct. 28
Ohio (Quotations of S. O. Ohio. Delivered any point in Ohio).			
U. S. Motor gasoline.....	8.375	8.375	8.375
Above 65 octane number..	8.625	8.625	8.625

Natural Gasoline

(Prices shown f.o.b. Group 3 and Breckenridge represent majority of sales made on dates shown to blenders on the freight basis shown below, although shipments may originate in other manufacturing districts, such as East Texas, Panhandle, Southwest Texas or Kansas).

F.o.b. Group 3			
Grade 26-70.....	3.875	3.75 – 3.875	3.75 – 3.875
F.o.b. Breckenridge			
Grade 26-70.....	3.625	3.50	3.50 – 3.625
California (F. o. b. plants in Los Angeles basin)			
75-85, 375-390 e.p. for blending.....	5.00 – 5.50	5.00 – 5.75	4.75 – 5.25

Kerosine

Western Penna. (Quotations and /or sales prices to car unloaders)			
Bradford-Warren:			
45 w.w. kerosine.....	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
46 w.w. kerosine.....	4.875– 5.00	4.875– 5.00	4.875– 5.00
47 w.w. kerosine.....	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125
Other districts:			
45 w.w. kerosine.....	4.625– 4.75	4.625– 4.75	4.625– 4.75
46 w.w. kerosine.....	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
47 w.w. kerosine.....	4.875– 5.00	4.875– 5.00	4.875– 5.00
Ohio (Quotations of S. O. Ohio. Delivered any point in Ohio).			
Kerosine.....	6.00	6.00	6.00
Oklahoma			
41-43 w.w. kerosine.....	3.375– 3.50	3.375– 3.50	3.375– 3.50
42-44 w.w. kerosine.....	3.50 – 3.625	3.50 – 3.625	3.50 – 3.625
Kansas (F. o. b. refinery ,Kansas destination)			
41-43 w.w. kerosine.....	3.625– 3.875	3.625– 3.875	3.625– 3.875
42-44 w.w. kerosine.....	3.875– 4.00	3.875– 4.00	3.875– 4.125
†***North Texas*** (F.o.b. Wichita Falls district for shipment to Texas and New Mexico destinations; Group 3 prices quoted on northern shipments)			
41-43 w.w. kerosine.....	3.50 – 3.625	3.375– 3.50	3.375– 3.50
†***East Texas*** (F.o.b. East Texas refinery for unrestricted shipment)			
41-43 w.w. kerosine.....	3.125– 3.25	3.125– 3.25	3.25
North Louisiana (For Louisiana and Arkansas destination)			
41-43 w.w. kerosine.....	3.75	3.75	3.75
Arkansas (For Arkansas and Louisiana destination)			
41-43 w.w. kerosine.....	4.25	4.25	4.25
California (F.o.b. California refineries)			
38-40 w.w. kerosine.....	4.00 – 5.00	4.00 – 5.00	4.00 – 5.00

Gas *and* Fuel Oils

Western Penna. (Quotations and/or sales prices to car unloaders)			
Bradford-Warren:			
36-40 fuel oil.....	4.25 – 4.375	4.125– 4.25	4.125– 4.25
‡*Other districts*:			
36-40 fuel oil.....	4.125– 4.25	4.00 – 4.125	4.00 – 4.125
‡Not including Pittsburgh.			
Oklahoma (F.o.b. Oklahoma refineries			
Gas oils:			
No. 1 white.....	3.125– 3.25	3.125– 3.25	3.125– 3.25
No. 1 straw.....	3.00 – 3.125	3.00 – 3.125	3.00 – 3.125
No. 2 straw.....	3.00 – 3.125	3.00 – 3.125	3.00 – 3.125
No. 2 dark.....	2.875– 3.00	2.875– 3.00	2.875– 3.00
U. G. I. gas oil.....	2.25 – 2.375	2.25 – 2.375	2.25 – 2.375
Fuel oils: (Prices per barre of 42 U. S. gallons)			
28-30, zero.....	$1.15 –$1.175	$1.15 –$1.175	$1.15 –$1.175
28-30.....	$1.00	$1.00	$1.00
24-26.....	$0.70 –$0.75	$0.70 –$0.75	$0.70 –$0.75
18-22.....	$0.675–$0.725	$0.675–$0.725	$0.70 –$0.725
14-16.....	$0.60 –$0.65	$0.60 –$0.65	$0.60 –$0.625

(*Continued on page* 64)

★ *All from* ONE SOURCE

★ GASOLINE ★
★ MOTOR OIL ★
★ TRACTOR OIL ★
★ GREASES ★
★ BRIGHT STOCK ★
★ NEUTRAL OILS ★
★ WAX ★ KEROSENE ★
★ DISTILLATE ★
★ TRACTOR FUEL ★

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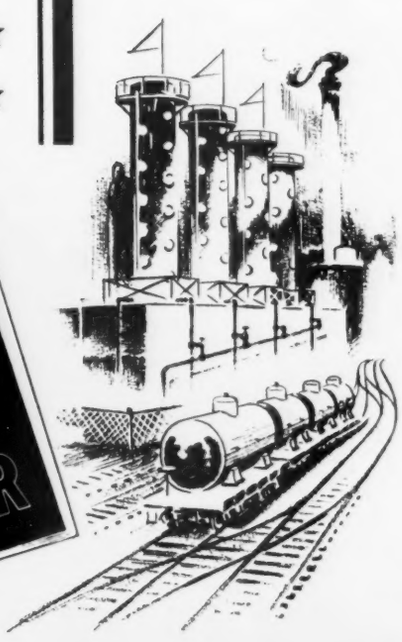

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Enid, Oklahoma

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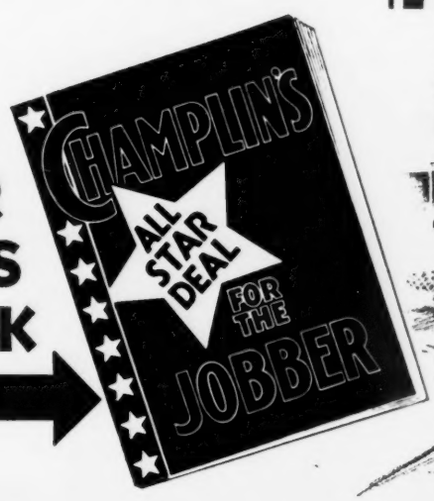

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(Continued from page 62)

	Nov. 11	Nov. 4	Oct. 28
Kansas (F.o.b. refinery, Kansas destination)			
No. 1 straw	3.375	3.375	3.375
18-22 fuel oil (per bbl.)	$0.725–$0.75	$0.725–$0.75	$0.725–$0.75
10-14 fuel oil (per bbl.)	$0.625–$0.65	$0.625–$0.65	$0.625–$0.65
North Texas (F.o.b. Wichita Falls district for shipment to Texas and New Mexico; Group 3 prices quoted on northern shipments).			
No. 1 straw	3.125	3.125	3.125
No. 1 white	3.25	3.25	3.25
No. 2	3.00	3.00	3.00
U.G.I. gas oil	2.125	2.125	2.125
24-26 fuel oil (per bbl.)	$0.70 –$0.725	$0.70 –$0.725	$0.70 –$0.725
18-22 fuel oil (per bbl.)	$0.65 –$0.675	$0.65 –$0.675	$0.65 –$0.675
West Texas (F.o.b. West Texas refineries for unrestricted shipment).			
No. 2	*2.75 – 3.00	*2.875– 3.00	*2.875– 3.00
18-22 fuel oil (per bbl.)	$0.65	$0.65	$0.65
East Texas (F.o.b. East Texas refineries for unrestricted shipment).			
No. 1 white	*3.00 – 3.125	*3.00 – 3.125	*3.00 – 3.125
No. 2	*2.75 – 2.875	*2.75 – 2.875	*2.75 – 2.875
U.G.I. gas oil	2.125– 2.25	2.125– 2.25	2.125– 2.25
24-26 fuel oil	$0.575–$0.60	$0.575–$0.60	$0.575–$0.60
20-24 fuel oil	$0.575	$0.575	$0.575
North Louisiana (For Louisiana and Arkansas destination).			
No. 2	3.00 – 3.125	3.00 – 3.125	3.125– 3.25
U.G.I. gas oil	2.875– 3.00	2.875– 3.00	2.875– 3.00
20-24 fuel oil	$1.00 –$1.025	$1.00 –$1.025	$1.00 –$1.025
16-20 fuel oil	$0.90 –$0.925	$0.90 –$0.925	$0.90 –$0.925
10-14 fuel oil	$0.75 –$0.80	$0.75 –$0.80	$0.75 –$0.80
Arkansas (For Arkansas and Louisiana destination)			
No. 2	3.50	3.50	3.50
28-30 gas oil, zero	3.25	3.25	3.25
20-24 fuel oil (per bbl.)	$0.825–$0.875	$0.825–$0.875	$0.825–$0.875
16-20 fuel oil	$0.725–$0.775	$0.725–$0.775	$0.725–$0.775
10-14 fuel oil	$0.60 –$0.65	$0.60 –$0.65	$0.60 –$0.65
California			
San Joaquin Valley, per bbl.:			
Grade C fuel oil	$0.50 –$0.75	$0.50 –$0.75	$0.50 –$0.75
Diesel fuel oil	$1.05 –$1.45	$1.05 –$1.45	$1.05 –$1.45
Stove distillate	$1.25 –$1.85	$1.25 –$1.85	$1.25 –$1.85
Los Angeles, per bbl.:			
Grade C fuel oil	$0.60 –$0.95	$0.60 –$0.95	$0.60 –$0.95
Diesel fuel	$1.05 –$1.45	$1.05 –$1.45	$1.05 –$1.45
Stove distillate	$1.25 –$1.85	$1.25 –$1.85	$1.25 –$1.85
San Francisco, per bbl ·			
Grade C fuel oil	$1.00	$1.00	$1.00
Diesel fuel	$1.68	$1.68	$1.68
Stove distillate	$2.10	$2.10	$2.10

Neutral Oils

Western Penna. (Quotations and/or sales prices to car unloaders)

Viscous Neutrals (Viscosity at 70° F.)

200 Vis. (180 at 100°) No. 3 color, 420-425 flash:			
0 pour test	25.00 –25.50	25.00 –25.50	25.00 –25.50
10 pour test	24.00 –24.50	24.00 –24.50	24.00 –24.50
15 pour test	23.50 –24.00	23.50 –24.00	23.50 –24.00
25 pour test	22.50 –23.00	22.50 –23.00	22.50 –23.00
180 Vis. (165 at 100) No. 3 color, 410-415 flash:			
25 pour test	21.00 –21.50	21.00 –21.50	21.00 –21.50
150 Vis. (143-100) No. 3 color, 400-405 flash:			
0 pour test	20.50 –21.00	20.50 –21.00	20.50 –21.00
10 pour test	19.50 –20.00	19.50 –20.00	19.50 –20.00
15 pour test	19.00 –19.50	19.00 –19.50	19.00 –19.50
25 pour test	18.00 –18.50	18.00 –18.50	18.00 –18.50

South Texas (F.o.b. South Texas refineries, for domestic shipment)

Vis. Color	(*Viscosity at* 100° F.; *pour test* 0)		
Pale Oils:			
100 No. 1½-2½	5.00	5.00	5.00
200 No. 2-3	7.00	7.00	7.00
300 No. 2-3	7.50	7.50	7.50
500 No. 2½-3½	8.50	8.50	8.50
750 No. 3-4	9.00	9.00	9.00
1200 No. 3-4	9.50	9.50	9.50
2000 No. 3-4	9.75 –10.00	9.75 –10.00	9.75 –10.00
Red Oils:			
200 No. 5-6	7.00	7.00	7.00
300 No. 5-6	7.50	7.50	7.50
500 No. 5-6	8.50	8.50	8.50
750 No. 5-6	9.00	9.00	9.00
1200 No. 5-6	9.50	9.50	9.50
2000 No. 5-6	9.75 –10.00	9.75 –10.00	9.75 –10.00

Note: South Texas red oil prices shown above cover oils with green cast; blue cast red oils are slightly lower in some cases.

***Nominal**

Mid-Continent (Viscosity at 100° F.; F. o. b. Tulsa basis. Prices represent quotations and sales).

0 to 10 Pour Point:

Vis. Color	Nov. 11	Nov. 4	Oct. 28
Pale Oils:			
60-85—No. 2	5.25	5.25	5.25
86-110—No. 2	5.75	5.75	5.75
150—No. 3	10.00	10.00	10.00
180—No. 3	11.25	11.25	11.25
200—No. 3	11.75	11.75	11.75
*250—No. 3	13.75	13.75	13.75
280—No. 3	14.75	14.75	14.75
300—No. 3	15.25	15.25	15.25
Red Oils:			
180—No. 5	10.25	10.25	10.25
200—No. 5	10.75	10.75	10.75
*250—No. 5	12.75	12.75	12.75
280—No. 5	13.75	13.50	13.50
300—No. 5	14.00	13.25	13.25

Note: Non-Viscous pale oils (60 to 110 Vis.) with a 15 to 25 pour point are quoted 0.5c under 0 to 10 pour test oils; pale and red viscous oils (150 to 300 Vis.) with 15 to 25 pour point are quoted 1c under 0 to 10 pour test oils. Viscous oils (150 to 300 Vis.) with a No. 4 color are quoted 0.5c above No. 5 color oils.

*This replaces 240 Vis. No. 3 color.

Chicago (F.o.b. Chicago refineries) (Vis. at 100° F.)

Vis. Color			
Pale Oils, *15 to 30 pour point:			
60-85—No. 2	6.50	7.00	7.00
86-110—No. 2	7.00	7.50	7.50
150—No. 3	10.00	10.25	10.25
180—No. 3	11.25	11.75	11.75
200—No. 3	11.75	12.25	12.25
250—No. 3	13.75	14.25	14.25
Red Oils, *15 to 30 Pour Point:			
180—No. 5	10.25	10.75	10.75
200—No. 5	10.75	11.25	11.25
250—No. 5	12.75	13.25	13.25
280—No. 5	13.25	13.75	13.75
300—No. 5	13.50	14.00	14.00

***Oils with 0 to 10 pour point bring 1c higher than above prices. To obtain prices delivered in Chicago, add 0.25c per gal.**

California (F.o.b. California refineries; Viscosity at 100° F.)

All neutral oils, 11.5c per gal. in tank car lots; and 13.5c in iron bbls., to refiners only, excluding federal tax.

Cylinder Stocks

Mid-Continent (F.o.b. Tulsa basis. Prices represent quotations and sales

Bright Stocks:			
190-200 Vis. at 210° D	20.00	20.00	20.00
150-160 Vis. at 210° D:			
0 to 10 pour test	17.00	17.00	17.00
10 to 25 pour test	16.50	16.50	16.50
25 to 40 pour test	16.00	16.00	16.00
150-160 Vis. at 210° E	16.00	16.00	16.00
120 Vis. at 210° D:			
0 to 10 pour test	16.50	16.50	16.50
10 to 25 pour test	16.00	16.00	16.00
25 to 40 pour test	15.50	15.50	15.50
600 Stm. Rfd. Dark Green	5.50 – 6.50	5.50 – 6.50	5.50 – 6.50
600 Stm. Rfd. Olive Green	6.50 – 8.00	6.50 – 8.00	6.50 – 8.00
631 Steam Refined	*10.00	*10.00	*10.00
Black oil	3.25 – 3.375	3.25 – 3.375	3.25 – 3.375

***Only one refiner quoting.**

Chicago (F.o.b. Chicago district refineries) (Viscosity at 210°)

Unfiltered Steam Refined:			
140	9.00	9.00 – 9.50	9.00 – 9.50
160	10.00	10.00 –10.50	10.00 –10.50
200	11.00	11.00 –11.50	11.00 –11.50
Bright stocks, 160 vis. at 210 No. 8 color:			
0 to 10 pour point	18.75	18.75 –19.25	18.25 –18.75
15 to 25 pour point	18.25	18.25 –18.75	17.75 –18.25
30 to 40 pour point	17.75	17.75 –18.25	17.25 –17.75
E filtered Cyl. Stock	14.00	14.00 –14.50	14.00 –14.50

(Continued on page 66)

Lee & Pomeroy, Port Tampa, Fla., find this 2 to 3-ton Model C-40 International unusually satisfactory in their business.

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INTERNATIONAL HARVESTER has not only built TRUCKS for 30 years; it has built REPUTATION for a quality product that people know can be counted on to deliver hauling economy spread over long mileage. The longer you look into what it takes to make lasting low-cost truck performance, the more you will be pleased with Internationals.

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Please send me your new 64-page booklet "I Drive Safely."

Name .....

Address .....

City ..... *State* .....

REFINERY TANK CAR MARKETS

CONTINUED FROM PAGE 64

Cylinder Stocks (cont'd)

	Nov. 11	Nov. 4	Oct. 28
Western Penna. (A.S.T.M. tests; quotations and/or sales prices to car unloaders)			
600 stm. rfd. filterable	9.50 –10.00	9.50 –10.00	9.50 –10.00
650 steam refined	11.00 –11.50	11.00 –11.50	11.00 –11.50
600 flash	12.00 –12.50	12.00 –12.50	12.00 –12.50
630 flash	17.00 –17.50	17.00 –17.50	17.00 –17.50
600 Warren E	13.00 –13.50	13.00 –13.50	13.00 –13.50
Bright stock, 145-155, vis. at 210°, 540-550 flash, No. 8 color:			
10 pour test	22.00 –22.50	22.00 –22.50	22.00 –22.50
15 pour test	21.00 –21.50	21.00 –21.50	21.00 –21.50
20 pour test	20.00 –20.50	20.00 –20.50	20.00 –20.50
25 pour test	19.00 –19.50	19.00 –19.50	19.00 –19.50

Petrolatums

Western Penna. (Per pound, in barrels, carload lots, f.o.b. Penna. refinery. In tank cars, 0.5c per pound less. Quotations are from majority of petrolatum makers).

Snow White	6.625	6.625	6.625
Lily White	5.625	5.625	5.625
Cream White	4.625	4.625	4.625
Light Amber	2.75	2.75	2.75
Amber	2.50	2.50	2.50
Red	2.00 – 2.125	2.00 – 2.125	2.00 – 2.125

Wax

Western Penna. (Per pound, f.o.b. New York)

122-124 wh. crude scale, A.m.p.	2.25 – 2.30	2.25 – 2.30	2.20 – 2.25
124-126 wh. crude scale, A.m.p.	2.30 – 2.35	2.25 – 2.30	2.20 – 2.25

Oklahoma (Per pound in barrels; in a few instances, per pound in burlap bags; f.o.b. Oklahoma refineries)

124-126 wh. crude scale. A.m.p.	2.25 – 2.375	2.25	2.25

Chicago (F.o.b. Chicago district refineries, in cents per pound, in bags carload lots. Melting points A.S.T.M. method; add 3° F. to convert into A.m.p.)

Fully refined:			
122-124	4.40 – 4.50	4.40 – 4.50	4.40 – 4.50
125-127	4.65 – 4.75	4.65 – 4.75	4.65 – 4.75
127-129	4.80 – 4.90	4.80 – 4.90	4.80 – 4.90
130-132	*5.20 – 5.30	*5.20 – 5.30	*5.20 – 5.30
132-134	*5.45 – 5.55	*5.45 – 5.55	*5.45 – 5.55
135-137	*6.20 – 6.30	*6.20 – 6.30	*6.20 – 6.30

*Same prices quoted in bags or slabs loose.

MID-WESTERN TANK CAR MARKETS

Following prices are in cents per gallon, except fuel oil in barrels of 42 U. S. gallons, in tank car lots, representing majority of sales of products made by Chicago sellers, from legally produced crude to jobbers on Group 3 freight basis, although shipments may originate in other South-western or Mid-western refining districts. Prices do not include state or federal taxes.

Gasoline

U. S. Motor gasoline:	Nov. 11	Nov. 4	Oct. 28
62 octane and below (3rd grade)	4.75	4.75	4.75
63-70 octane (regular)	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75
71 octane and above			
60-62, 400 e.p.	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
64-66, 375 e.p.	4.875– 5.00	4.875– 5.00	4.875– 5.00
68-70, 350-360 e.p.	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125

Kerosine

41-43 w.w.	3.25 – 3.375	3.25 – 3.375	3.25 – 3.375
42-44 w.w.	3.375– 3.50	3.375– 3.50	3.375– 3.50

Fuel *and* Gas Oils

Domestic:			
No. 1 prime white	3.125– 3.25	3.125– 3.25	3.125– 3.25
No. 1 straw	3.00 – 3.25	3.00 – 3.25	3.00 – 3.25

*Formerly Chicago Tank Car Markets.

	Nov. 11	Nov. 4	Oct. 28
No. 2 straw	2.875– 3.00	2.875– 3.00	2.875– 3.00
No. 2 dark	2.75 – 2.875	2.75 – 2.875	2.75 – 2.875
No. 3	2.625– 2.75	2.625– 2.75	2.625– 2.75
No. 4 (per bbl.)	$0.85 –$0.90	$0.85 –$0.90	$0.85 –$0.90
No. 5 (per bbl.)	$0.625–$0.65	$0.625–$0.65	$0.625–$0.65
Industrial:			
No. 4, (per bbl.)	$0.75 –$0.80	$0.75 –$0.80	$0.75 –$0.80
No. 5, (per bbl.)	$0.575–$0.60	$0.575–$0.60	$0.575–$0.60
No. 6, (per bbl.)	$0.45 –$0.50	$0.45 –$0.50	$0.45 –$0.50
U.G.I. gas oil	2.25 – 2.375	2.25 – 2.375	2.25 – 2.375

Naphtha *and* Solvent

Stoddard solvent	6.375	6.375	6.375
V. M. & P. naphtha	6.875	6.875	6.875
Cleaners' naphtha	6.875	6.875	6.875
Mineral spirits	5.875	5.875	5.875
Rubber solvent	6.875	6.875	6.875
Lacquer diluent	7.875	7.875	7.875

DAILY GASOLINE PRICES

Daily range of gasoline prices (cents per gallon) in tank cars, as reported in PLATT'S OILGRAM, (Week Ended Nov. 8, 1935)

	Nov. 4	Nov. 5	Nov. 6	Nov. 7	Nov. 8
U. S. Motor, 62 octane & below (3rd grade):					
East Texas	4.625– 4.75	4.625– 4.75	4.625– 4.75	4.625– 4.75	4.625– 4.75
*North Texas	4.75	4.75	4.75	4.75	4.75
West Texas	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
Oklahoma	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
Mid-Western (Group 3 basis)	4.75	4.75	4.75	4.75	4.75
U. S. Motor, 63-70 octane (regular):					
East Texas					
*North Texas	5.625	5.625	5.625	5.625	5.625
West Texas	5.625– 5.75	5.625– 5.75	5.625– 5.75	5.625– 5.75	5.625– 5.75
Oklahoma	5.625– 5.75	5.625– 5.75	5.625– 5.75	5.625– 5.75	5.625– 5.75
Mid-Western (Group 3 basis)	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75
Motor Gasoline, 60-64 octane					
New York harbor	6.00	6.00 – 6.25	6.00 – 6.25	6.25	6.25
Philadelphia district	6.00	6.00	6.00	6.00	6.00
Baltimore district	6.00	6.00	6.00	6.00	6.00
Motor Gasoline, 65 octane & above					
New York harbor	6.25	6.25 – 6.50	6.25 – 6.50	6.50	6.50
Philadelphia district	6.25	6.25	6.25	6.25	6.25
Baltimore district	6.25	6.25	6.25	6.25	6.25
U. S. Motor Gasoline					
Bradford-Warren (Western Penna.)	5.125– 5.25	5.125– 5.25	5.125– 5.25	5.25 – 5.375	5.25 – 5.375
Other districts (Western Penna.)	5.125– 5.25	5.125– 5.25	5.125– 5.25	5.25 – 5.375	5.25 – 5.375
Motor Gasoline, Minimum 60 octane					
Bradford-Warren (Western Penna.)	6.75 – 6.875	6.75 – 6.875	6.75 – 6.875	6.75 – 6.875	6.75 – 6.875
Other districts (Western Penna.)	6.75 – 6.875	6.75 – 6.875	6.75 – 6.875	6.75 – 6.875	6.75 – 6.875
Motor Gasoline, Minimum 65 octane					
Bradford-Warren (Western Penna.)	7.00 – 7.125	7.00 – 7.125	7.00 – 7.125	7.00 – 7.125	7.00 – 7.125
Other districts (Western Penna.)	7.00 – 7.125	7.00 – 7.125	7.00 – 7.125	7.00 – 7.125	7.00 – 7.125

*For shipment to Texas and New Mexico destinations; Group 3 prices are quoted on northern shipments.

TANK WAGON, SERVICE STATION MARKETS

Tax column includes 1c federal tax, state gasoline tax, also city and county taxes as indicated in footnotes, and inspection fees, as shown in general footnote. These prices in effect Nov. 11, 1935, as posted by principal marketing companies at their headquarters offices, but subject to later corrections.

S. O. New Jersey

Essolene

	Consumer Tank Car	Dealer T.W.	Taxes	Posted S.S.	Kerosine T.W.
Atlantic City, N. J.	7	9.5	4	17	9
Newark, N. J.	7	9.5	4	17	7.5
Annapolis, Md.	7.3	9.8	5	18.3	10
Baltimore, Md.	6.8	9.3	5	17.8	7.5
Cumberland, Md.	8.3	10.8	5	19.3	12.7
Washington, D. C.	7	9.5	3	16	9
Danville, Va.	8.1	10.6	6	20.1	12.9
Norfolk, Va.	6.6	9.1	6	18.6	11.3
Petersburg, Va.	7.3	9.8	6	19.3	11.7
Richmond, Va.	7.3	9.8	6	19.3	11.7
Roanoke, Va.	8.3	10.8	6	20.3	12.9
Charleston, W. Va.	7.5	10	5	18.5	12.6
Parkersburg, W. Va.	6.8	9.3	5	17.8	11.2
Wheeling, W. Va.	8	10.5	5	19	12.2
Charlotte, N. C.	8.4	10.9	7	21.4	12.9
Hickory, N. C.	8.7	11.2	7	21.7	13.1
Mt. Airy, N. C.	8.7	11.2	7	21.7	13.2
Raleigh, N. C.	8.1	10.6	7	21.1	12.7
Salisbury, N. C.	8.5	11	7	21.5	13
Charleston, S. C.	6.7	9.2	7	19.7	11.3
Columbia, S. C.	8	10.5	7	21	12.6
Spartanburg, S. C.	8.4	10.9	7	21.4	12.9

Price basis to undivided dealers: Dealer t.w. price less 0.5c per gal.

Price basis to commercial consumers: Beginning Feb. 11, 1935, all new commercial consumers will be signed on following differentials over tank car price, on yearly purchases: up to 35,999 gals., 2.5c over t.c.; 36,000 to 119,999 gals., 2c; 120,000 to 239,999 gals., 1.5c; 240,000 to 479,999 gals., 1c; and over 480,000 gals., 0.5c.

Above prices apply only when deliveries are made in lots of 50 or 100 gals. at one time, depending on code region in which deliveries are effected.

If deliveries are made in less than these minimum quantities, s.s. price at time and place of delivery applies.

Non-contract customers will be billed at 2.5c over tank car price at time and place of delivery.

Kerosine Discount: 1c off t.w. price for 25 gals. or more, under contract thru territory (Baltimore City contract not necessary) except no discount in state of New Jersey.

Socony-Vacuum Oil Co., Inc.

(*S. O. New York Division*)

Socony Mobilgas

	"Split" Dealer T.W.	Taxes	Total "Split" Dealer T.W.	S.S.	Kerosine T.W.
Metropolitan N. Y. City: Boroughs of Manhattan, Bronx and Queens	10.25	*5	15.25	*19.5	7
Borough of Richmond (Staten Is.)	9.75	*5	14.75	*18.5	7.35
Borough of Brooklyn	10	*5	15	*19	7
Albany, N. Y.	9.2	5	14.2	17.7	7.5
Binghamton, N. Y.	9.5	5	14.5	18	8.75
Buffalo, N. Y.	7	5	12	14	8
Jamestown, N. Y.	9.8	5	14.8	18.3	8
Plattsburg, N. Y.	10.2	5	15.2	18.7	8.5
Rochester, N. Y.	8	5	13	16	8
Syracuse, N. Y.	8.5	5	13.5	16	8.5
Danbury, Conn.	9.35	4	13.35	16.5	7.5
Hartford, Conn.	9.3	4	13.3	16.8	6.75
New Haven, Conn.	9.2	4	13.2	16.7	6.75
Bangor, Me.	10	5	15	18.5	8.5
Portland, Me.	9.5	5	14.5	16.5	7.5
Boston, Mass.	9	4	13	16.5	7
Concord, N. H.	10.2	5	15.2	18.7	8.25
Lancaster, N. H.	11.2	5	16.2	20	9.25
Manchester, N. H.	9.8	5	14.8	18.3	7.75
Providence, R. I.	8	3	11	13.5	7
Burlington, Vt.	11.2	5	16.2	19.7	8.5
Rutland, Vt.	11.1	5	16.1	19.6	9

*Plus 2% city sales tax computed at time of each sale.

Discounts to dealers: thru territory, except New York City, off normal s.s. price, 4c to undivided dealers, and 3.5c to "split" dealers. In metropolitan New York City, to undivided dealers, 4.75c; in Brooklyn, 4.5c; in Staten Island, 4.25c. Split dealers receive 0.5c less margin than undivided dealers.

To commercial consumers: Effective Feb. 4, 1935, covering yearly purchases, billed at posted tank car price, plus these differentials: 2.5c for delivery of 1,200 to 36,000 gals ; plus 2c, for 36,000 to 120,000 gals.; plus 1.5c for 120,000 to 240,000 gals.; plus 1c for 240,000 to 480,000 gals.; plus 0.5c for 480,000 gals. and over. Those buying less than 1,200 gals. yearly, get retail s.s. price.

Atlantic Refining

Atlantic White Flash Plus Gasoline

	Total T.W.	Taxes	Total T.W.	S.S.	Kerosine T.W.
Philadelphia, Pa.	11	5	16	18	9
Pittsburgh, Pa.	12	5	17	19	10
Allentown, Pa.	11.5	5	16.5	18.5	9
Erie, Pa.	11	5	16	18	8
Scranton, Pa.	11.5	5	16.5	18.5	10
Altoona, Pa.	12	5	17	19	10
Dover, Del.	11.5	5	16.5	18.5	10
Wilmington, Del.	11	5	16	18	9
Boston, Mass.	9	4	13	16.5	7
Springfield, Mass.	9.2	4	13.2	16.7	7.5
Worcester, Mass.	9.3	4	13.3	15.5	7.5
Fall River, Mass.	9.2	4	13.2	14.5	7.5
Providence, R. I.	9	3	12	13.5	7
Hartford, Conn.	9.3	3	12.3	15.8	7
New Haven, Conn.	9.2	3	12.2	15.7	7.5
Atlantic City, N. J.	9.5	4	13.5	17	9
Camden, N. J.	9.5	4	13.5	17	8.5
Trenton, N. J.	9.5	4	13.5	17	8
Annapolis, Md.	9.8	5	14.8	18.3	9.5
Baltimore, Md.	9.3	5	14.3	17.8	7.5
Hagerstown, Md.	9.5	5	14.5	14.5	10
Richmond, Va.	9.8	6	15.8	19.3	11.7
Wilmington, N. C.	9.3	7	16.3	19.8	11.4
Brunswick, Ga.	11	7	18	20	*14
Jacksonville, Fla.	10.5	8	18.5	20.5	10

Dealer discounts: on Atlantic White Flash Plus gasoline, thru territory, divided dealers, price equal to 3.5c off posted s.s. price; undivided dealers, price equal to 4c off posted s.s. price; authorized dealers contracts previous to Aug. 19, 1933, price equal to 3c less than posted s.s. price, plus 1c rental.

Discounts to commercial consumers: Consumer t.w. accounts billed at full t.w. price, with these discounts, effective Dec. 4, 1934, on yearly purchases: 1800 to 36,000 gals., 1.5c; 36,000 to 120,000 gals., 2c; 120,000 to 240,000 gals., 3c; 240,000 to 480,000 gals., 3.25c; 480,000 gals. and over, 3.5c. Those buying less than 100 gals. get retail s.s. price.

*Georgia kerosine has 1c state tax, not included in above prices.

S. O. Ohio

Sohio X-70 Gasoline

Ohio statewide	12	5	17	19	*12.5

Renown (Third Grade Gasoline)

Ohio statewide	11.5	5	16.5	17.5	....
Counties off statewide gasoline schedule: Butler, Champaign, Clark, Darke, Franklin, Greene, Hamilton, Miami, Montgomery, Preble and Summit	12	5	17	19	....

Statewide Prices to Resellers & Agents

(These prices are on sliding scale based on actual spread between S. O. Ohio statewide tank car price and posted local s.s. price).

Including taxes	†Undivided Accounts	Divided Accounts	**Authorized Agents
Sohio X-70	15.5	16	16
Renown (3rd grade)	15	15.5	15.5

Note: On single deliveries of motor gasolines under 25 gallons, to t.w. consumers, s.s. price applies.

Sales tax: Ohio's 3% sales tax, effective Jan. 27, 1935, is added "where assessable, to regular posted prices", S. O. Ohio says.

*Kerosine prices include 1c state tax. Kerosine t.w. price in Hardin and Wyandot counties is 11.5c

†Excluding authorized agents.

**Excluding 0.5c rental.

Discounts to contract tank wagon consumers only: on all motor gasolines, effective Dec. 1, 1934, off posted t.w. price, on deliveries per month: 1,000 to 9,999 gals., 1.5c per gal. 10,000 gals. and over, 2.5c. Under 1,000 gals., full t.w. price. Single deliveries of less than 25 gals., full s.s. price. Additional yearly discounts (less amount paid or credited to buyer on monthly purchases), off t.w. price: 12,000 to 119,999 gals., 1.5c; 120,000 gals. or over, 2.5c.

Discounts on kerosine: to dealers and commercial consumers, 3c per gal. off t.w. price, any quantity.

S. O. Kentucky

Crown Gasoline

	T.W.	Taxes	Total T.W.	S.S.	Kerosine T.W.
Lexington, Ky.	13.5	6	19.5	21.5	10
Louisville, Ky.	12.5	6	18.5	20.5	10
Paducah, Ky.	12.5	6	18.5	20.5	10
Covington, Ky.	12	6	18	20	10.5
Jackson, Miss.	12	7	19	21	*11
Vicksburg, Miss.	12	7	19	21	*12
Birmingham, Ala.	13	*8	21	23	12
Mobile, Ala.	12	8	20	22	10
Montgomery, Ala.	13	*9	22	24	*15.5
Macon, Ga.	13	7	20	22	*13
Atlanta, Ga.	13	7	20	22	*12
Augusta, Ga.	13	7	20	22	*14
Savannah, Ga.	11	7	18	20	*13
Jacksonville, Fla.	10.5	8	18.5	20.5	10
Miami, Fla.	10.5	8	18.5	20.5	13
Tampa, Fla.	10.5	8	18.5	20.5	10
Pensacola, Fla.	10	*9	19	20	11.5

Kyso (Third Grade)

Lexington, Ky.	12.5	6	18.5	20	....
Louisville, Ky.	10.5	6	16.5	17.5	....
Paducah, Ky.	10	6	16	16.5	....
Covington, Ky.	10.5	6	16.5	18.5	....
Jackson, Miss.	10	7	17	18	....
Vicksburg, Miss.	10	7	17	18	....
Birmingham, Ala.	11	*8	19	20	....
Mobile, Ala.	10	*8	18	19	....
Montgomery, Ala.	11	*9	20	21	....
Atlanta, Ga.	9.5	7	16.5	17	....
Augusta, Ga.	9.5	7	16.5	17	....
Macon, Ga.	9.5	7	16.5	17	....
Pensacola, Fla.	8	*9	17	17	....

Dealer Discount: off posted s.s. price, on Crown and Crown Ethyl gasolines to "undivided" dealers 4c; on Kyso, 3c. To "divided" dealers: Crown and Ethyl, 3.5c, and Kyso, 2.5c, all effective on or about Jan. 1, 1934.

Discounts to tank wagon consumers: all single deliveries of 25 gals. or less, get posted s.s. price: all single deliveries of 25 gals. or more, to be billed at posted t.w. price, plus following discounts, off posted t.w. price: Ethyl and Crown gasoline, 25 to 2,999 gals. monthly, 1.5c; Kyso, 1c; 3,000 to 24,999 gals., Ethyl and Crown, 2c; Kyso, 1.5c; 25,000 gals. or more, Ethyl and Crown, 3c; and Kyso, 2.5c.

Taxes: in the tax column is included these city and county gasoline taxes at the following points: Birmingham, 1c city; Mobile, 1c city; Montgomery, 1c city and 1c county; Pensacola, 1c city. Georgia and Mississippi kerosine prices include 1c state tax. Montgomery kerosine price includes ⅝c city tax.

S. O. Indiana

Standard Red Crown Gasoline

Chicago, Ill.	10	4	14	16	9.8
Decatur, Ill.	11.5	4	15.5	17.5	9.8
Joliet, Ill.	11.5	4	15.5	17.5	9.8
Peoria, Ill.	11.5	4	15.5	15.5	9.8
Quincy, Ill.	11.3	4	15.3	17.3	9.6
Indianapolis, Ind.	12.4	*5	17.4	19.4	‡14.5
Evansville, Ind.	12.2	*5	17.2	19.2	‡14.3
South Bend, Ind.	12.6	*5	17.6	19.6	‡12
Detroit, Mich.	9.5	4	13.5	15.5	9.3
Grand Rapids, Mich.	11.6	4	15.6	16.6	10.5
Saginaw, Mich.	12.8	4	16.8	18.8	9.3
Green Bay, Wisc.	12.2	5	17.2	19.2	10.5
Milwaukee, Wisc.	10.3	5	15.3	16.8	10.1
La Crosse, Wisc.	11.9	5	16.9	18.9	10.2
Minneapolis, Minn.	12.9	4	16.9	17.9	10.2
Duluth, Minn.	12.3	4	16.3	18.3	10.6
Mankato, Minn.	11.9	4	15.9	17.9	10.2
Des Moines, Iowa	11.3	4	15.3**	18.3	9.6
Sioux City, Iowa	11.5	4	15.5**	17.5	9.8
Davenport, Iowa	11.5	4	15.5**	17.5	9.8
Mason City, Iowa	11.7	4	15.7**	17.7	10
St. Louis, Mo.	11.2	†4	15.2	17.2	9.5
Kansas City, Mo.	10.9	†4	14.9	14.9	9.2
St. Joseph, Mo.	10.9	†4	14.9	16.9	9.2
Fargo, N. D.	12.9	4	16.9	18.9	11.2
Minot, N. Dak.	14.1	4	18.1	20.1	12.4
Huron, S. Dak.	12.4	*5	17.4	19.4	10.7
Wichita, Kans.	10.4	4	14.4	16.4	6.3

Note: Kerosine s.s. prices are generally 3c above normal t.w. price.

Above prices include these inspection fees on both gasoline and kerosine, per gallon, figured on basis of 50 gallons per barrel:

Alabama, 1/40c on gasoline, 1/2c on kerosine; Arkansas, 1/5c per gal. in a single barrel, 1/20c per gal. in bulk; Florida, 1/8c; Illinois, 3/100c; Indiana, 1/2c per gal. in a single barrel; 3/10c per gal. in lots of 2 to 10 bbls., 1/5c for 10 to 50 bbls., 2/25c for over 50 bbls.; Kansas, 1/50c, (3/50c can be charged to meet inspection department expenses); Louisiana, 1/32c; Minnesota, 1/25c; Missouri, 3/100c; Nebraska, 3/100c; Nevada, gasoline, 1/20c; North Carolina, 1/4c; North Dakota, 1/20c; Oklahoma, 2/25c per gal. in lots of more than 50 bbls., 1/5c in lots less than 50 bbls.; South Carolina, 1/8c; South Dakota, 1/10c; Tennessee 2/5c; and Wisconsin, 1/25c.

Kerosine inspection fee only: Iowa, 2/25c; Michigan, 4/5c per gal. for first 2 bbls.; 3/5c for next 3; 2/5c for next 5; 3/10c for next 15, and 1/5c per gal. in lots over 25 bbls.

TANK WAGON, SERVICE STATION MARKETS

Tax column includes 1c federal tax, state gasoline tax, also city and county taxes as indicated in footnotes, and inspection fees, as shown in general footnote. These prices in effect Nov. 11, 1935, as posted by principal marketing companies at their headquarters offices, but subject to later corrections.

S. O. Indiana (Cont'd)

Stanolind Gasoline (Third Grade)

Stanolind normal prices are 1c under normal Red Crown prices, thru territory. Among subnormal points are the following:

	Total Tax	T.W.	S.S.	Kerosine T.W.
Decatur, Ill.	10.5 4	14.5	16	....
Peoria, Ill.	10.5 4	14.5	14.3	....
Evansville, Ind.	11.2 *5	16.2	17.7	....
Indianapolis, Ind.	11.4 *5	16.4	18.1	....
Des Moines, Iowa	8.6 4	12.6**	17.3	....
Detroit, Mich.	8 4	12	14	....
Grand Rapids, Mich.	10.6 4	14.6	15.6	....
Milwaukee, Wis.	9.3 5	14.3	15.8	....
Huron, S. D.	11.4 *5	16.4	18.4	....
Wichita, Kans.	7.5 4	11.5	13.9	....

†St. Louis, Kansas City and St. Joseph prices include 1c city tax. ‡Includes 4c state tax.

*South Dakota gasoline and kerosine prices include 0.1c for sales tax. Indiana t.w. and s.s. gasoline prices include 0.2c for chain store tax.

**Service station prices for gasoline at Iowa points represent the opinion of National Petroleum News as to prices prevailing at the majority of stations.

Discounts to dealers: Effective Dec. 1, 1934, thru territory, except Michigan effective Apr. 1, 1935, and except Chicago division and Iowa, maximum discounts to controlled and uncontrolled undivided gasoline accounts, off s.s. price at normal points: Ethyl and Red Crown gasoline, 3.5c; Stanolind 2.5c; in Chicago, effective July 1, 1935, Ethyl and Red Crown, 4c; Stanolind, 3c. Divided gasoline accounts thru territory, get 0.5c less per gallon. In case of lease and agency and AAA accounts, the above discounts include the 0.5c per gal. rental allowance. In Iowa, normal dealer prices are 1.5c below normal t.w. price for first and second grade gasolines, and 0.5c under normal t.w. for third grade.

Discounts to commercial consumers: effective Jan. 1, 1935, thru territory, except Michigan effective Feb. 1, on purchases per month, discount off t.w. price; all gasolines, 25 to 1,000 gals., at t.w. price; 1,000 gals. or more, 1.5c off t.w. on Ethyl and Red Crown, and 0.5c on Stanolind. Purchases of less than 25 gals. get regular s.s. price.

S. O. Nebraska

Standard Red Crown Gasoline

Omaha, Neb.	11.9	5	16.9	18.9	10.1
McCook, Neb.	12.6	5	17.6	19.6	10.8
Norfolk, Neb.	12.3	5	17.3	19.3	10.5
North Platte, Neb.	12.7	5	17.7	19.7	10.9
Scottsbluff, Neb.	13.4	5	18.4	20.4	11.6

Reliance Gasoline (Third Grade)

Omaha, Neb.	10.5	5	15.5	15.5	....
McCook, Neb.	11.1	5	16.1	18.1	....
Norfolk, Neb.	11.3	5	16.3	18.3	....
North Platte, Neb.	11.7	5	16.7	18.7	....
Scottsbluff, Neb.	12.4	5	17.4	19.4	....

Discount to dealers: where service station gasoline prices are normal, resellers' allowance off service station prices are (*Maximum* over-all, including rent) as follows: Reliance, 2½c; Standard Red Crown, and Red Crown Ethyl, 3½c. Where service station gasoline prices are below normal, resellers' allowances are reduced one-half of the amount below normal, down to the following (*Minimum* over-all including rent): Reliance, 2c, Standard Red Crown and Red Crown Ethyl 3c.

Discount to consumers: for tank wagon deliveries covered only by Standard Commercial Consumer Contract, effective January 1, 1935.

S. O. Louisiana

Essolene

	Consumer Tank Car	Dealer T.W	Taxes	Posted S.S.	Kerosine T.W.
Little Rock, Ark.	7	9.5	7.5	20.5	11.5
Alexandria, La.	7	9.5	*8	21	*10.5
Baton Rouge, La.	7	9.5	*7	20	*11.5
New Orleans, La.	7	9.5	*8	21	*12
Lake Charles, La.	7.5	10	*8	21.5	*11
Shreveport, La.	6.5	9	*7	19.5	*9
Lafayette, La.	7.5	10	*8	21.5	*12.5
Bristol, Tenn.	9.1	10.35	8	21.1	14.5
Chattanooga, Tenn.	9.5	12	8	23.5	11.5
Knoxville, Tenn.	10	12.5	8	24	14
Memphis, Tenn.	8	10.5	8	22	9.5
Nashville, Tenn.	9	11.5	8	23	10

*Baton Rouge and Shreveport gasoline tax includes 5c state tax, 1c federal tax, and 1c parish tax. Alexandria, Lake Charles, Lafayette and New Orleans, 2c parish tax. Louisiana kerosine prices include 1c state tax; New Orleans kerosine includes also 1c parish tax.

Price basis to dealers: Undivided dealers get dealer price, less 0.5c.

Price basis to commercial consumers: Effective Feb. 11, 1935, commercial consumers not under contract will be billed at 2.5c per gal. above posted bulk plant tank car price at time and place of delivery in lots of 50 gals. or more at one time. Contract customers will be billed at following differentials over tank car price, on yearly purchases: up to 35,999 gals., 2.5c over tank car price; 36,000 to 119,999 gals., 2c over; 120,000 to 239,999 gals. 1.5c; 240,000 to 479,999 gals., 1c; 480,000 gals. and over, 0.5c.

On single deliveries to all classes of commercial consumers, of less than 50 gals., s.s. price at time and place of delivery applies.

Magnolia Petroleum

Mobilgas

	Total Tax	T.W.	S.S.	Kerosine T.W.
Muskogee, Okla.	11 5	16	18	8
Oklahoma City	11 5	16	18	8
Tulsa, Okla.	11 5	16	18	8
Fort Smith, Ark.	9.5 †5	14.5	18	8
Little Rock, Ark.	9.5 7.5	17	20.5	9.5
Texarkana, Ark.	10.5 *5	15.5	17.5	8
Dallas, Tex.	10 5	15	17	7
Ft. Worth, Tex.	10 5	15	17	7
Houston, Tex.	11 5	16	18	8
San Antonio, Tex.	11 5	16	18	8
El Paso, Tex.	12 5	17	19	10
Santa Fe, N. M.	13.5 **7	20.5	22.5	12
Roswell, N. M.	12.5 ††6.5	19	21	10

Metro Gasoline (Third Grade)

Muskogee, Okla.	8	5	13	15	....
Oklahoma City	9	5	14	16	....
Tulsa, Okla.	9	5	14	16	....
Fort Smith, Ark.	9.5	5	14.5	16.5	....
Little Rock, Ark.	9.5	7.5	17	17	....
Texarkana, Ark.	7.5	5	12.5	14.5	....
Dallas, Tex.	7	5	12	14	....
Ft. Worth, Tex.	7	5	12	14	....
Houston, Tex.	8	5	13	15	....
San Antonio, Tex.	9	5	14	16	....
El Paso, Tex.	10	5	15	17	....
Santa Fe, N. M.	11.5 **7	18.5	20.5	....	
Roswell, N. M.	10.5 ††6.5	17	19	....	

*In Texarkana, 4c Texas tax applies; outside Texarkana, 6.5c Arkansas tax applies.

†In Fort Smith, 4c Oklahoma tax applies outside Fort Smith, 6.5c Arkansas tax applies.

**Includes 1c city tax.

††Includes 0.5c city tax.

Note: *Price basis to dealers* off s.s. price in t.w., bulk or bbl. deliveries, on Mobilgas and Ethyl, normally: to 100% dealers, 4c; to divided dealers, 3.5c. On Metro gasoline in Texas, Oklahoma and New Mexico: to 100% dealers, 3c; to divided dealers 2.5c. On Metro, in Arkansas and Louisiana: to 100% dealers 3c.

Price basis to consumers: thru Texas, Oklahoma and New Mexico, except federal and state governments and political sub-divisions thereof; and also drainage, navigation and reclamation districts and road contractor accounts in Texas (in Texas all foregoing accounts receive same graduated discounts allowed 100% dealers, on all grades of gasoline, which see in above paragraph). All grades of gasoline invoiced at consumer's t.w. price, which normally is 2c less than s.s. price, less following contract quantity discounts at end of month, on monthly purchases: 3,001 to 10,000 gals., Mobilgas and Ethyl, 1c, Metro, 0.5c; 10,001 gals. and over, Mobilgas and Ethyl, 2c, Metro, 1c; 25 to 3,000 gals., no discount. Thru Arkansas and Louisiana, all grades gasoline invoiced at consumer's t.w. price, which on Mobilgas and Ethyl, normally is 3.5c less than s.s. price, less following contract quantity discounts at end of month, on all three grades, on monthly purchases: 3,001 to 10,000 gals., 0.5c; 10,001 to 20,000 gals., 1c; 20,001 to 40,000 gals., 1.5c; and 40,001 gals. and over, 2c. Metro invoiced at same price as Mobilgas.

Continental Oil

Conoco Bronze Gasoline

Denver, Colo.	13	5	18	20	11
Pueblo, Colo.	13	5	18	20	13
Grand Junc., Colo.	15.5	5	20.5	22.5	15
Casper, Wyo.	13.5	5	18.5	20.5	11.5
Cheyenne, Wyo.	13.5	5	18.5	20.5	13
Billings, Mont.	13.5	6	19.5	21.5	16.5
Butte, Mont.	15	6	21	23	17.5
Great Falls, Mont.	14.5	6	20.5	22.5	17.5
Helena, Mont.	15.5	6	21.5	23.5	17.5
Salt Lake City, Utah.	13	5	18	20	16
Boise, Ida.	16.5	6	22.5	24.5	18
Twin Falls, Ida.	17	6	23	25	18
Albuquerque, N. M.	13.5	†6.5	20	22	13

Continental Oil (Cont'd)

Demand (Third Grade)

	Total Tax	T.W.	S.S.	Kerosine T.W.
Denver, Colo.	11 5	16	18	....
Cheyenne, Wyo.	11.5 5	16.5	18.5	....
Helena, Mont.	13.5 6	19.5	21.5	....
Salt Lake City, Utah.	10 5	15	17	....
Boise, Ida.	14.5 6	20.5	22.5	....
Albuquerque, N. M.	11.5 †6.5	18	20	....

†Includes city tax of 0.5c.

Discounts: effective March 1, 1934, on gasolines, thru territory, off s.s. price: to "undivided" dealers: Ethyl and Conoco Bronze, 4c; Demand, 3c; to "divided" dealers: Ethyl and Conoco Bronze, 3.5c; Demand, 2.5c.

S. O. California

Standard Gasoline

San Francisco, Cal.	9.5	4	13.5	15.5	10
Los Angeles, Cal.	9	4	13	15	10.5
Fresno, Cal.	10.5	4	14.5	16.5	9
Phoenix, Ariz.	11.5	6	17.5	19.5	†16
Reno, Nev.	11.5	5	16.5	18.5	13
Portland, Ore.	10.5	6	16.5	18.5	13.5
Seattle, Wash.	10.5	6	16.5	18.5	13.5
Spokane, Wash.	13.5	6	19.5	21.5	16.5
Tacoma, Wash.	10.5	6	16.5	18.5	13.5

Flight Gasoline (Third Grade)

San Francisco, Cal.	8	4	12	14	....
Los Angeles, Cal.	7.5	4	11.5	13.5	....
Fresno, Cal.	8.5	4	12.5	14.5	....
Reno, Nev.	10	5	15	17	....
Phoenix, Ariz.	10	6	16	18	....
Portland, Ore.	9	6	15	17	....
Seattle, Wash.	9	6	15	17	....
Spokane, Wash.	12	6	18	20	....
Tacoma, Wash.	9	6	15	17	....

†Includes 5c state tax.

Discounts: on gasoline: on Stanavo Aviation, Standard Ethyl, and Standard gasolines, to 100% dealers, 2c below t.w. price; on Flight, 1c per gal. below t.w. To "split" dealers, all brands gasoline 1c below t.w.

Effective September 24, 1935, to commercial consumers: advance quantity discount from above prices extended at time of delivery, on Stanavo Aviation, Standard Ethyl and Standard gasolines, 2c per gal.; Flight, 1c.

On kerosine: tank car delivery, 3.5c off t.w. price to all classes of trade; transport truck and trailer deliveries, 3.5c below t.w. to resellers; plant deliveries to jobbers, 3c below t.w.

Canada

Prices of Imperial Oil Ltd.

Per Imperial Gallon, which is 1.2 U. S. Gallons

Imperial Three Star Gasoline

Hamilton, Ont.	16	6	21	23.5	16.5
Toronto, Ont.	16	6	21	23.5	16.5
Brandon, Man.	23.3	7	30.3	33.3	21.8
Winnipeg, Man.	21.7	7	28.7	31.7	20.2
Regina, Sask.	23	7	30	33	21.5
Saskatoon, Sask.	25.8	7	32.8	35.8	24.3
Edmonton, Alta.	25.2	7	32.2	35.2	23.7
Calgary, Alta.	22.5	7	29.5	32.5	21
Vancouver, B. C.	17.5	7	24.5	27.5	24
Montreal, Que.	14.5	6	20.5	23	17
St. John, N. B.	18	8	26	30	19.5
Halifax, N. S.	18	8	26	30	19.5

Discount to dealers and A.R.D. Accounts:

On gasoline, effective May 14, 1934: in Maritime Provinces, all dealers get 4c off s.s. price; in all other provinces, open dealers get 3c off s.s. price and 1c additional to 100% accounts, except Montreal City, Hamilton and Toronto, where open dealers get 2.5c off s.s. price with 1c additional to 100% accounts.

Aviation Gasoline

Following are tank car and/or tank wagon prices of aviation gasoline in principal marketing territories (Stanavo aviation in all territories except Continental Oil and Magnolia Pet. Co.) Tax column includes 1c federal tax, and state tax; also municipal taxes as indicated in footnotes.

Effective Nov. 11, 1935

S. O. New Jersey

	Tank Car	T.W.
Bayonne, N. J.	9.75	12
Baltimore, Md.	9.5	12
Washington, D. C.	....	12.6
Richmond, Va.	....	13.5
Greensboro, N. C.	....	14.9
Raleigh, N. C.	....	14.6
Charleston, W. Va.	....	14.2

TANK WAGON, SERVICE STATION MARKETS

Tax column includes 1c federal tax, state gasoline tax, also city and county taxes as indicated in footnotes, and inspection fees, as shown in general footnote. These prices in effect Nov. 11, 1935, as posted by principal marketing companies at their headquarters offices, but subject to later corrections.

Colonial Beacon Oil Co.

	T.W.
Brooklyn, N. Y.	12.8
Buffalo, N. Y.	13.7
Boston, Mass.	13.5

S. O. Pennsylvania

Philadelphia, Pa.	14.1
Pittsburgh, Pa.	14.9

S. O. Louisiana

F.O.B. Tulsa	8.5

Prices in above four territories do not include state or federal taxes. They are for 73 octane grade aviation gasoline. An 80 octane product generally brings 0.5c premium and an 87 octane product, 1.5c premium over the 73 octane grade.

Note: S.s. prices in above four territories are generally 6c over t.w. prices. Following discounts apply for t.w. deliveries, on monthly purchases, off t.w. price: 3,000 to 10,000 gals., 0.5c; 10,000 to 20,000 gals., 1c; 20,000 to 40,000 gals., 1.5c; and over 40,000 gals., 2c. Consumer t.w. price is generally tank car price, plus freight, plus 2.5c per gal.

S. O. Ohio

	T.W.	Tax	Total T.W.
Thru Ohio: (To Commercial Consumers) Stanavo Ethyl Aviation (73 Octane):	15.5	5	20.5

Discounts: For delivery on contract to hangar operators and resellers: 2c below commercial consumer posted t.w. price.

S. O. Indiana

Chicago, Ill.	14.5	4	18.5
Indianapolis, Ind.	15.4	5	20.4
Detroit, Mich.	15.7	4	19.7
Milwaukee, Wisc.	14.8	5	19.8
Minneapolis, Minn.	14.9	4	18.9
St. Louis, Mo.	13.2	*4	17.2
Kansas City, Mo.	13.9	*4	17.9
Fargo, N. D.	15.9	4	19.9
Huron, S. D.	**15.4	5	20.4
Wichita, Kans.	13.4	4	17.4

*Includes 1c city tax.
**Includes 0.1c to cover sales tax.

Magnolia Petroleum

Dallas, Tex.	13	5	18

Humble Oil & Refining Co.

	Tank Car
Baytown, Tex. (exclusive of taxes)	8.2

Continental Oil Co.

	T.W.	Tax	Total T.W.
Denver, Colo.	16	5	21
Cheyenne, Wyo.	16.5	5	21.5
Helena, Mont.	19.5	6	25.5
Salt Lake City, Utah	16	5	21
Albuquerque, N. M.	16.5	*6.5	23

*Includes city tax of 0.5c.

S. O. California

Phoenix, Ariz.	14	6	20
Los Angeles, Cal.	11.5	4	15.5
San Francisco, Cal.	12	4	16
Reno, Nev.	13.5	5	18.5
Portland, Ore.	12.5	6	18.5
Seattle, Wash.	12.5	6	18.5
Spokane, Wash.	15.5	6	21.5

Note: For discounts, etc., see note under Standard and Flight gasoline above.

Naphtha

In Effect Nov. 11, 1935

(In Tank Wagon or Steel Barrels; in Cents per Gallon)

	Mineral Spirits	V.M.&P. Naphtha	Cleaner Naphtha	*Solvent
Altoona, Pa.	....	....	....	17
Baltimore (net)	11	....	....	11
Boston (net)	11	13	13	11
Bridgeport	....	....	....	13.5
Buffalo (net)	....	....	....	14
Chicago	15.7	16	15	15
Detroit	†17.4	†18.5	....	†18.5
Kansas City	13.4	14.4	14.4	13.4
Lancaster, Pa.	....	....	....	17
Milwaukee	18.3	†19.3	19.3	18.3
Minneapolis	†17.4	†18.4	†18.4	†16.9
Newark (net)	13	....	....	13
New York (net)	11	13	13	11
Philadelphia (net)	11.5	13	13	11.5
Providence (net)	11	11	....	11
Rochester (net)	‡12	....	....	‡12
St Louis	13.7	14.7	14.7	13
Syracuse	....	....	....	14

Petroleum Spirits (Solvent)

In Tank Cars (F.o.b. refinery or seaboard terminal)	
New York Harbor	9
Philadelphia district	9
Providence	9

Note: 2c off above t.w. prices to large buyers in some instances.

*In the East, prices apply on product generally known as Mineral Spirits; in the middlewest, prices apply on Stanosol (S. O. Indiana grade of Stoddard Solvent).

†At the following points, these taxes and/or discounts apply on the products specified: Detroit, first three products include 3c state tax, prices applying on 150 gals. or more, with prices 1c higher for less than 150 gals.; Milwaukee, V.M.&P. price includes 4c state tax; Minneapolis, first 3 products include 3c state tax; price for solvent for less than 100 gals. is 1c higher.

‡Purchases of at least 150 gallons.

Latest Changes

From Nov. 5 to Nov. 11 inclusive. Dates and amounts of changes shown. See table for full current prices. Changes are on gasoline unless kerosine is indicated.

S. O. New York—Mobilgas:

Thru New England and eastern New York, up 0.1c to 0.8c, Nov. 7. New York City advance was 0.2c, on Nov. 8.

Prices at New England points in this issue do not reflect this change, due to lack of details.

S. O. Kentucky—Kyso:

Atlanta, Augusta and Macon, t.w. cut 0.5c, Nov. 7.

S. O. Louisiana—Essolene:

Thru Tennessee, up 0.5c, Nov. 9.

Corrections

Notation of amount of change and dates not previously shown in table. Table in this issue is corrected to show these changes. Changes are on gasoline unless kerosine is indicated.

S. O. Kentucky—Crown:

Mobile, up 1c, Nov. 2.

Kyso:

Pensacola, t.w. up 0.5c, Oct. 17.

Mobile, up 1c, Nov. 2.

Montgomery, t.w. cut 1c, s.s. cut 2c, Oct. 19; t.w. up 1c, s.s. up 2c, Oct. 21.

Kerosine:

Savannah, cut 1c, Oct. 22.

Covington, cut 1c, Oct. 30.

Tampa, cut 1c, Oct. 19.

Prices at Mobile and Augusta have been in error for several past issues. Thru oversight, these were not changed to correspond to the notes on page 52, August 21 issue: Mobile has been 10c since July 22; Augusta, 14c since July 29.

S. O. California—Standard:

Advance of 1c to 3.5c thru California and Arizona, reported as of Oct. 31 in Nov. 6 issue, page 61, was effective Nov. 1. Fresno and San Francisco were up 1c, instead of 1.5c as previously reported; Phoenix was up 2.5c.

Flight:

Fresno up 0.5c, instead of 1c, Nov. 1, as reported on page 61 of Nov. 6 issue.

Los Angeles up 3c, Nov. 1, instead of Oct. 31.

Phoenix up 2c, Nov. 1.

Italy Tightens Control Of Nation's Oil

(By Teletype)

NEW YORK, Nov. 11.—Several moves have been made by the Italian government recently to tighten its control over the domestic use of petroleum products in Italy and conserve its supplies for the Ethiopian conflict.

The most recent were governmental decrees which ended free trade in mineral oils and authorized the government to requisition the nation's supplies, if necessary. A limit was established on sales of gasoline and mineral oils to individuals, who are not to purchase more of these products than they did in the previous year.

Another move which is expected to effectively limit the domestic use of gasoline in Italy was the raising of the government gasoline tax again. The latest raise in the tax brought the retail selling price to over $1.10 a gallon.

While the possibility that the League of Nations would ban the sale of gasoline and oil to Italy still loomed, American suppliers queried on the situation generally, expressed doubt as to the effectiveness of such a move. The League would probably not affect Roumanian, Russian or U. S. oils, they point out, and these three nations could keep Italy amply supplied with oil.

The feeling also was general among many American oil exporters that Italy now has enough oil in storage to last eight months or a year if need be and could get along without any further imports for that period.

Appointment is announced by Four Wheel Drive Auto Co., Clintonville, Wis., of H. M. Daniels as supervisor of the new consolidated eastern sales division and A. F. Waterland as manager of the newly established Philadelphia branch.

Five Million-Car Year Predicted As N.Y. Auto Show Ends

NEW YORK, Nov. 11

AFTER playing for one solid week to capacity audiences the New York auto show last Saturday packed up its belongings and hit the road to give performances throughout the month all over the country.

The unconventional early showing of new models in November, instead of the usual January, was in the nature of an experiment to aid employment stability throughout the year in the auto industry. While attendance did not quite measure up to the figure set at the show last January, the selling record at the show just closed indicates the experiment may take on a permanent air.

The Automobile Manufacturers Association, sponsors of the New York show, canvassed the exhibitors and found this to be the largest retail selling show since 1929. Some companies almost doubled their sales, with the average running over 60 per cent above those for the show last January. In addition, every exhibitor reports a larger prospect list with sales possibilities as soon as used cars are appraised.

The success of the show has further added to the manufacturers' confidence in their early estimates that between 4,500,000 and 5,000,000 of the 1936 passenger cars and trucks will be sold. It is the general feeling that the industry will enjoy a bigger portion of the Christmas trade than it has in past years when new models, even when announced in January, were not obtainable until a month or two later. This fact, incidentally, is also giving some visible concern to local retail merchants, who can readily see that the Christmast purchase of an automobile painfully steps on one of their biggest toes.

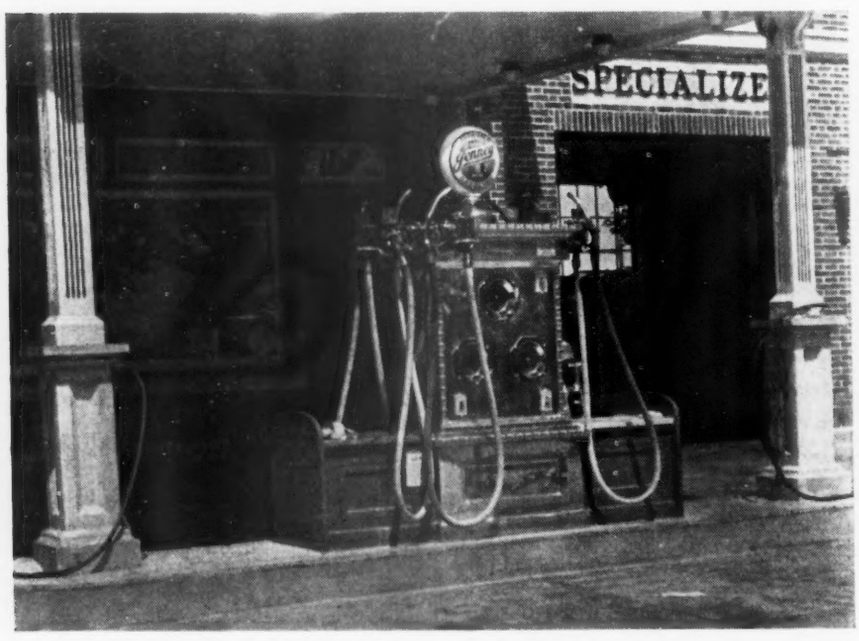
But the amazing increase in the value of the car buyer's dollar cannot be overlooked. Rather interesting figures to show this fact come from the statistical pens of the Automobile Manufacturers' Association. In 1925 a car buyer paid $31.50 per horsepower for his car. Today the price is $7.80 per horsepower, or a decline of 75 per cent.

On a basis of weight the 1925 price per car was 41 cents per pound. Today it is 23 cents per pound, a decrease of 44 per cent. If wheelbase is used as the comparative standard shows that ten years ago the cost per inch was $9.60, whereas today your new car costs $5.90 per inch, or a decrease of 39 per cent.

It is the consensus that the early show date will be repeated again next year as this time is expected to work to the best advantage of all concerned in the industry—the manufacturer, the factory worker, and the dealer.

Following is a list of the automobile show dates throughout the country:

Dallas, Texas	Nov. 9-11
Akron, O.	Nov. 9-15
Columbus, O.	Nov. 9-15
Buffalo, N. Y.	Nov. 9-16
Newark, N. J.	Nov. 9-16
Detroit	Nov. 9-16
Toronto, Can.	Nov. 9-16
Indianapolis	Nov. 9-16
Portland, Me.	Nov. 9-16
Cincinnati, O.	Nov. 10-16
St. Louis, Mo.	Nov. 10-16
New Haven, Conn.	Nov. 11-16
Philadelphia	Nov. 11-16
Pittsburgh, Pa.	Nov. 11-16
Omaha, Neb.	Nov. 11-16
Brooklyn, N. Y.	Nov. 11-16
Asbury Park, N. J.	Nov. 11-17
South Bend, Ind.	Nov. 13-17
Toledo, O.	Nov. 15-21
Bridgeport, Conn.	Nov. 16-23
Hartford, Conn.	Nov. 16-23
Boston, Mass.	Nov. 16-23
Chicago	Nov. 16-23
Hartford, Conn.	Nov. 16-23
Norfolk, Va.	Nov. 16-23
Des Moines, Ia.	Nov. 18-23
Elmira, N. Y.	Nov. 18-23
Rochester, N. Y.	Nov. 18-23
Ottawa, Ont.	Nov. 18-23
Syracuse, N. Y.	Nov. 18-23
Nashville	Nov. 18-24
Grand Rapids, Mich.	Nov. 19-23
Cleveland	Nov. 23-30
Minneapolis	Nov. 23-30
Montreal, Can.	Nov. 23-30
Memphis, Tenn. (Tri-State)	Nov. 25-30
Springfield, Mass.	Nov. 25-30
Peoria, Ill.	Nov. 27-Dec. 1
Minneapolis, Minn.	Nov. 28-30
Kas. City, Mo.	Nov. 30-Dec. 6
Milwaukee	Nov. 30-Dec. 7
Miami, Fla.	Nov.30-Dec. 7
New Orleans	Dec. 1- 3
Birmingham, Ala.	Dec. 1- 4
Denver, Colo.	Dec. 2- 7
Globe, Ariz.	Dec. 2- 7
Oneida, N. Y.	Dec. 2- 7
Red Bank, N. J.	Dec. 2- 7
Seattle, Wash.	Dec. 2- 8
Atlantic City, N. J. (ASI Show)	Dec. 9-13
Atlantic City, N. J.	Dec. 9-18



All company operated stations of the Jenney Mfg. Co., of Boston, are readily identified by bright copper-encased gasoline pumps. The units were designed and made by Jenney, with the exception of the pump units. The housing is made of sheet copper, and the trimmings, such as the dial frames, are of stainless steel. The housings are designed to contain three or four pump units. Stations selling three grades of gasoline can service any grade at either side of the pump. At stations where four grades are sold, two grades are dispensed at each side

Synthetic Rubber

The Rubber Chemicals Division of the du Pont Co. announces that its new plant for the manufacture of its synthetic rubber, known as DuPrene, is now complete and is producing at the rate of approximately 1,000,000 pounds a year. The plant is located at Deep Water, New Jersey.

10-Cent Advance in Heavy Fuel Oils Anticipated on Atlantic Coast

THE fuel oil market was about the same in the week ended Nov. 9 as it has been for the past several weeks. Threats of colder weather in some areas caused a flurry of buying of the lighter grades in some districts. The heavy grades continued to accumulate as industrial buying lagged.

The flurry of buying of the lighter grades renewed the hope of refiners that the seasonal buying of the lighter grades was under way. However, the threats of cold weather failed to stimulate buying up to normal for this time of year. Prices of the lighter grades were unchanged.

While the stocks of the heavy grades of fuel oil became burdensome in some quarters, and some price shading was noted, no general change in prices was made by refiners the week ended Nov. 9.

* * *

NEW YORK, Nov. 9.—General interest in the fuel oils in the week ended Nov. 9 shifted to the heavier grades, following advances in prices for the light fuels in the previous week.

Demand for heavy fuel showed some improvement at harbor terminals along the eastern seaboard and persistent reports of a probable 10-cent-a-barrel advance were heard throughout the week. Up to the close of business Nov. 9, however, no definite price advances were reported.

Those seeking for a higher harbor price for heavy fuels pointed out that the cargo price for Grade C bunker oil at the Gulf is 70 cents a barrel, and the cost of bringing the oil up the coast, plus the Gulf price, is more than the 95-cent price prevailing along the seaboard.

Light fuel oils were fairly active during the week and prices appeared stable at the higher levels reached in the previous week. Demand was somewhat better as cooler weather prevailed in some sections late in the week.

* * *

TULSA, Nov. 9.—Movement of light fuel oil to be used for heating purposes continued to disappoint Mid-Continent suppliers. The cold snap in the northern consuming area evidently was of too short duration to cause any appreciable depletion of distributors' stocks. In the meantime only straggling orders were placed in the Mid-Continent. Despite the lack of interest, refiners were not disposed to push the sale of light fuels. Most of them continued to store their supplies. In most cases, refiners' storage oil was covered by contract orders. No price changes were reported on the Nos. 1, 2 and 3 oils. The latter grade was unusually tight.

Heavy fuel oil still was accumulating at refineries. About the only outlet for this oil was to the railroads. Mid-Continent refiners were unable to attract industrial orders.

CHICAGO, Nov. 9.—While weather conditions have increased interest in the Mid-Western tank car market for light fuel oils for heating purposes, no change was noted in quoted prices throughout the week ended Nov. 9.

Nos. 1, 2 and 3 oils were receiving the greater portion of attention. Several sellers indicated that higher prices for these grades of oil were in the offing.

Michigan light fuel oils have receded to a point where they are becoming less of a factor in the Mid-Western market. Eastern Wisconsin and the state of Michigan were furnishing a ready market for Michigan fuel oils, it was reported.

Heavy fuel oils continued to display an extremely spotty price structure. While little change was noted in quoted price levels, there were indications of "special offerings" in the Mid-Western market last week.

Fuel Oils

Following are tank wagon prices of various grades of heating oil at the points shown in various territories. Prices are in cents per gallon.

Prices in Effect Nov. 11, 1935

	No. 1	No. 2	No. 3	No. 4
S. O. New Jersey				
Newark, N. J.	7.5	6	6	6
Atlantic City, N. J.	8	6.5	6.5	6
Baltimore, Md.	7.5	6	6	5.5
Washington, D. C.	8	6.5	6.5	6.5

Discounts: At Newark and Atlantic City, purchasers taking 50,000 gals. get discount of 0.5c per gal.

	No. 1	No. 2	No. 3	No. 4
Socony-Vacuum Oil Co., Inc.				
(S. O. New York Division				
New York City	7.25	6.25	6.25	5.75
Albany, N. Y.	7.5	6.5	6.5	6.5
Rochester, N. Y.	8.5	7	7	7
Boston, Mass.	7	6.25	6.25	6.25
Bangor, Me.	9.5	6.5	6.5	6.5
Manchester, N. H.	9	7.25	7.25	7.25
Burlington, Vt.	8.5	7	7	7
New Haven, Conn.	7.5	6	6	6
Providence, R. I.	7	6	6	6

Discounts: At New York City, consumers taking 10,000 to 50,000 gals., get 0.25c per gal. discount when minimum amount has been reached; above 50,000 gals., 0.5c

	No. 1	No. 2	No. 3	No. 4
Atlantic Refining				
Philadelphia, Pa.	6.50	5.50	....	5.5
Allentown, Pa.	9	7.5	7.5	7.5
Wilmington, Del.	8.5	7	....	6.5
Springfield, Mass.	8.75	7.25	....	7.25
Worcester, Mass.	8.75	7.25	....	7.25
Hartford, Conn.	8.5	7	....	7

S. O. Ohio				
Ohio Statewide	8	7.75	7.50	7.25

Note: S. O. Ohio prices are for hose dumps; bucket dumps are 0.5c per gallon higher.

S. O. Indiana

Stanolex Fuel Oil No. 1

Chicago	7
Indianapolis, Ind	*13.4
Detroit, Mich	7.5
Minneapolis, Minn	9.2
Sioux City, Ia	8.8
St. Louis, Mo	8.5
Kansas City, Mo	8.2

*Includes state tax of 4c.

Discounts: at Chicago above fuel oil prices apply on 150 gals. or more; 100 to 149 gals., 0.5c higher, under 100 gals., 1.5c higher. Indianapolis and Detroit 1c off t.w. price for deliveries of 100 gals. and over; at St. Louis, 1c off for 50 gal. dumps and over; at other above points, 1c off t.w. price for deliveries 150 gals. and over.

High Prices Paid At Lease Sale

MUSKOGEE, Okla., Nov. 8.—Two months ago a tract of 120 acres was rejected by bidders at the Five Civilized Tribes' lease sale here at not being worth even $2 an acre.

Initial bid for the tract, when it was put on the block at the sale here Nov. 7, was $100 an acre, and it finally went to Carter Oil Co. and Gypsy Oil Co. for $550 an acre.

The tract adjoins diagonally the lease on which the Carter Oil Co. and associates recently opened a deep pay in the old Fox pool area when a well drilled to slightly over 8000 feet blew in as a gusher.

The revival of interest in the southeast and southern sections of Oklahoma made the lease sale the most profitable for the Five Civilized Tribes this year, and the third most profitable in its history.

Bidders bought 7248.05 acres, paying an average of $15.08 an acre, or a total bonus of $109,260.73. The 120-acre tract brought a total bonus of $66,000.

While the Carter county tracts drew considerable interest, the most consistently high prices were paid for tracts in Jefferson county, near the Texas-Oklahoma line. Several major operators, according to reports, have had seismograph crews at work in that area. Sinclair Prairie Oil Co. bought five tracts in that county, paying approximately $9546.

Diesel Questions Answered

Couched in a simple, direct way and avoiding technical discussion throughout, a new 14-page rotogravure booklet just issued by Caterpillar Tractor Co., Peoria, Ill., tells the "Whys and Hows of Diesel Engines."

SEABOARD MARKETS, Export *and* Coastwise

PRICES *DO NOT* INCLUDE FEDERAL TAX

Where $ mark is shown, prices are per barrel of 42 U. S. gallons.

Eastern Domestic

(Prices in cents per gallon tank car lots, unless otherwise noted, f.o.b. refinery or seaboard terminal, representing majority of sales and quotations to jobbers and/or consumers. Florida and S. Carolina inspection tax not included.)

*Motor Gasoline

Prices Nov. 11	60-64 Octane	65 Octane and Above
New York harbor	6.25	6.50
New York harbor, barges	6.00	6.25
Philadelphia district	6.00	6.25
Baltimore district	6.00	6.25
Norfolk district	6.00	6.25
Wilmington, N. C., district	6.00	6.25
Charleston, S. C., district	6.00	6.25
Savannah district	6.25 – 6.50	6.50 – 6.75
Jacksonville district	6.25 – 6.50	6.50 – 6.75
Portland district	6.25	6.50
Boston district	6.25	6.50
Boston district, barges	6.00	6.25
Providence district	6.00	6.50
Providence district, barges	5.75	6.25

*Due to lack of companies offering U. S. Motor gasoline, 59 octane and below in the open market, prices for this grade are discontinued. Quotations nominally are 0.25c below those for 60-64 octane grade.

Water White Kerosine

Prices Nov. 11			
New York harbor	5.00	Savannah district	5.50
N. Y. harbor, barges	4.875	Jacksonville district	5.50
Philadelphia district	5.25	Portland district	5.25
Baltimore district	5.25	Boston district	5.00
Norfolk district	5.25	Boston dist., barges	4.875
Wilmington, N. C.	5.25	Providence district	5.00
Charleston, S. C., dist.	5.25	Providence, barges	4.875

*Fuel Oils

Prices Nov. 11	New York harbor	New York harbor, barges	Philadelphia district
No. 1	5.00	4.875	5.25
No. 2	4.00	3.875	4.00
No. 3	4.00	3.875	4.00
No. 4	3.625– 3.75	3.50 – 3.625	3.625
No. 5 (per barrel)	$1.15	.....	$1.15
No. 6 (per barrel)	$0.95	.....	$0.95

	Baltimore district	Boston district
No. 1	5.25	5.00
No. 2	4.00	4.00
No. 3	4.00	4.00
No. 4	3.625	4.00
No. 5 (per barrel)	$1.15	$1.25
No. 6 (per barrel)	$0.95	$0.95

	Boston dist., barges	Providence district	Providence dist., barges
No. 1	4.875	5.00	4.875
No. 2	3.875	4.00	3.875
No. 3	3.875	4.00	3.875
No. 4	3.875	3.625– 3.75	3.50 – 3.625

*Fuel oils meet specifications of U. S. Commercial Standards CS12-35.

	Bunker Oil Grade C Per Barrel	Diesel Oil Ships' Bunker† Per barrel	Gas Oil 28-34 Gravity Per gallon	Diesel Oil Shore Plants Per gallon
New York harbor	*$0.95	*$1.65	4.00	4.00
Philadelphia dist.	*$0.95	*$1.65	4.00	....
Baltimore district	*$0.95	*$1.65	4.00	....
Norfolk district	*$0.95	*$1.65	4.00	....
Charleston district	$0.90	$1.65	....	....
Savannah district	$0.90	$1.65	....	4.50
Jacksonville dist.	$0.90	$1.65	....	4.50
Tampa district	$0.90	$1.65	....	....
Portland district	$1.05	$1.75	....	....
Boston district	$0.95	*$1.65	....	....
Providence district	$0.95	$1.65	....	....

*Lighterage for bunker oil, 5c per bbl. additional; for Diesel oil, 6.5c per bbl. additional.

Pacific Export

(Quotations are at seaboard, Los Angeles, in cargo lots, cents per gallon, except where otherwise noted.)

Prices—	Nov. 11	Nov. 4	Oct. 28
53-55 U. S. Motor	4.75 – 5.25	4.75 – 5.00	4.75 – 5.00
400 e.p. blend 65 Octane and above	5.00 – 6.00	5.00 – 5.50	5.00 – 5.50
38-40 w.w. kerosine, 150 fire point	4.25 – 5.00	4.25 – 5.00	4.25 – 5.00
41-43 w.w. kerosine	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00
44 water white kerosine	5.00	5.00	5.00
Prime wh. kerosine	4.00 – 4.50	4.00 – 4.50	4.00 – 4.50
In Cargo lots, per barrel:			
Diesel fuel oil, above 23.9°	$1.10 –$1.15	$1.10 –$1.25	$1.10 –$1.25
Diesel fuel oil, under 23.9°	$1.05 –$1.15	$1.05 –$1.15	$1.05 –$1.15
30-34 gas oil	$1.10 –$1.15	$1.10 –$1.15	$1.10 –$1.15
Grade C fuel oil	$0.80 –$0.85	$0.80 –$0.85	$0.80 –$0.85
In Ships' Bunkers, or deep tank lots, per barrel			
Diesel fuel oil, above 23.9 gravity	$1.125–$1.15	$1.275–$1.30	$1.275–$1.30
Diesel, under 23.9 gravity	$1.10 –$1.15	$1.175–$1.20	$1.175–$1.20
Grade C fuel oil	$0.825–$0.85	$0.925–$0.95	$0.925–$0.95

Pacific Export (cont'd)	Nov. 11	Nov. 4	Oct. 28
Cased Goods:			
Gasoline, U.S. Motor	$1.40 –$1.50	$1.40 –$1.50	$1.40 –$1.50
Gasoline, 400 e.p. blend	$1.60 –$1.75	$1.60 –$1.75	$1.60 –$1.75
38-40 w.w. kerosine, 150 fire point	$1.15 –$1.30	$1.15 –$1.30	$1.15 –$1.30
Kerosine, prime white	$1.15 –$1.20	$1.10 –$1.20	$1.10 –$1.20

New York Export

(Prices in cents per gallon in barrels, F.a.s. New York)

Cylinder Oils (Pennsylvania Products)

	Nov. 11	Nov. 4	Oct. 28
Bright stock:			
Light, 25 pour point	26.00	26.00	26.00
Dark, 25 pour point	25.50	25.50	25.50
Neutral oil:			
200 3 color, 25 pour pt.	29.50	29.25	29.25
150 3 color, 25 pour pt.	25.00	24.50	24.50
600 Warren E filtered	20.00	20.00	20.00
600 stm. refd. unfiltered	16.50	16.50	16.50
650 stm. rfd. unfiltered	18.00	18.00	18.00
600 flash, steam refined	19.00	19.00	19.00
630 flash, steam refined	24.00	24.00	24.00

Wax Domestic *and* Export

(Prices in cents per pound. Tests made by A. S. T. M. methods. Melting points shown below, however, are A. M. P., 3° higher than A. S. T. M. (E. M. P.) melting points. Export prices are f.a.s. carload lots. Domestic prices are f.o.b. refineries in New York and New Orleans districts, in bags, carload lots, with 0.2c discount allowed for shipment in bulk).

	New York		New Orleans	
Prices—Nov. 11	*Domestic*	*Export*	*Domestic*	*Export*
124-6 Y.C. scale	2.25	2.25	2.25	2.25
122-4 W.C. scale	2.25	2.25	2.25	2.25
124-6 W.C. scale	2.25 – 2.35	2.25 – 2.35	2.25 – 2.35	2.25 – 2.35
123-5 Fully refined	4.20	3.625	4.20	3.625
125-7 Fully refined	4.30	3.75	4.30	3.75
128-30 Fully refined	4.55	4.00	4.55	4.00
130-2 Fully refined	4.80	4.25	4.80	4.25
133-5 Fully refined	*5.10	4.75	*5.10	4.75
135-7 Fully refined	*5.35	5.00	....	....

*Shipment either in bags or in bulk.

Gulf Coast

(Prices are f.o.b. Gulf oil terminals representing sellers' opinions except prices specified to the contrary. Prices cover bulk shipments of 20,000 barrels or more, unless otherwise noted.)

Motor Gasoline

For Domestic Shipment

Prices—	Nov. 11	Nov. 4	Oct. 28
59 octane and below	5.25	5.25	5.25
60-64 octane number	5.375– 5.50	5.375– 5.50	5.375– 5.50
65 octane and above	5.50 – 5.625	5.50	5.50

Fuel Oils

No. 1 Fuel oil	4.00	4.00	3.875– 4.00
No. 2 Fuel oil	3.25	3.25	3.125– 3.25
No. 4 Fuel oil	3.00	3.00	2.875– 3.00

Kerosine

41-43 w.w.	4.00	4.00	4.00

Gasoline

For Export Shipment

U. S. Motor gasoline	5.125– 5.25	5.125	5.125
60-62, 400 e.p. gasoline	5.125– 5.25	5.125	5.125
61-63, 390 e.p. gasoline	5.25 – 5.375	5.25	5.25
64-66, 375 e.p. gasoline	5.50	5.375– 5.50	5.375– 5.50
U. S. Motor, cases (cargoes)	$1.20 –$1.25	$1.20 –$1.25	$1.20 –$1.25
64-66, 375 e.p. cases (cargoes)	$1.25 –$1.30	$1.25 –$1.30	$1.25 –$1.30

Kerosine

44 water white	4.25	4.25	4.25
41-43 water white	3.875– 4.00	3.875– 4.00	3.875– 4.00
41-43 prime white	3.875	3.875	3.875
W.W., cases (cargoes)	$1.15 –$1.20	$1.15 –$1.20	$1.15 –$1.20
P.W., cases (cargoes)	$1.10 –$1.15	$1.10 –$1.15	$1.10 –$1.15

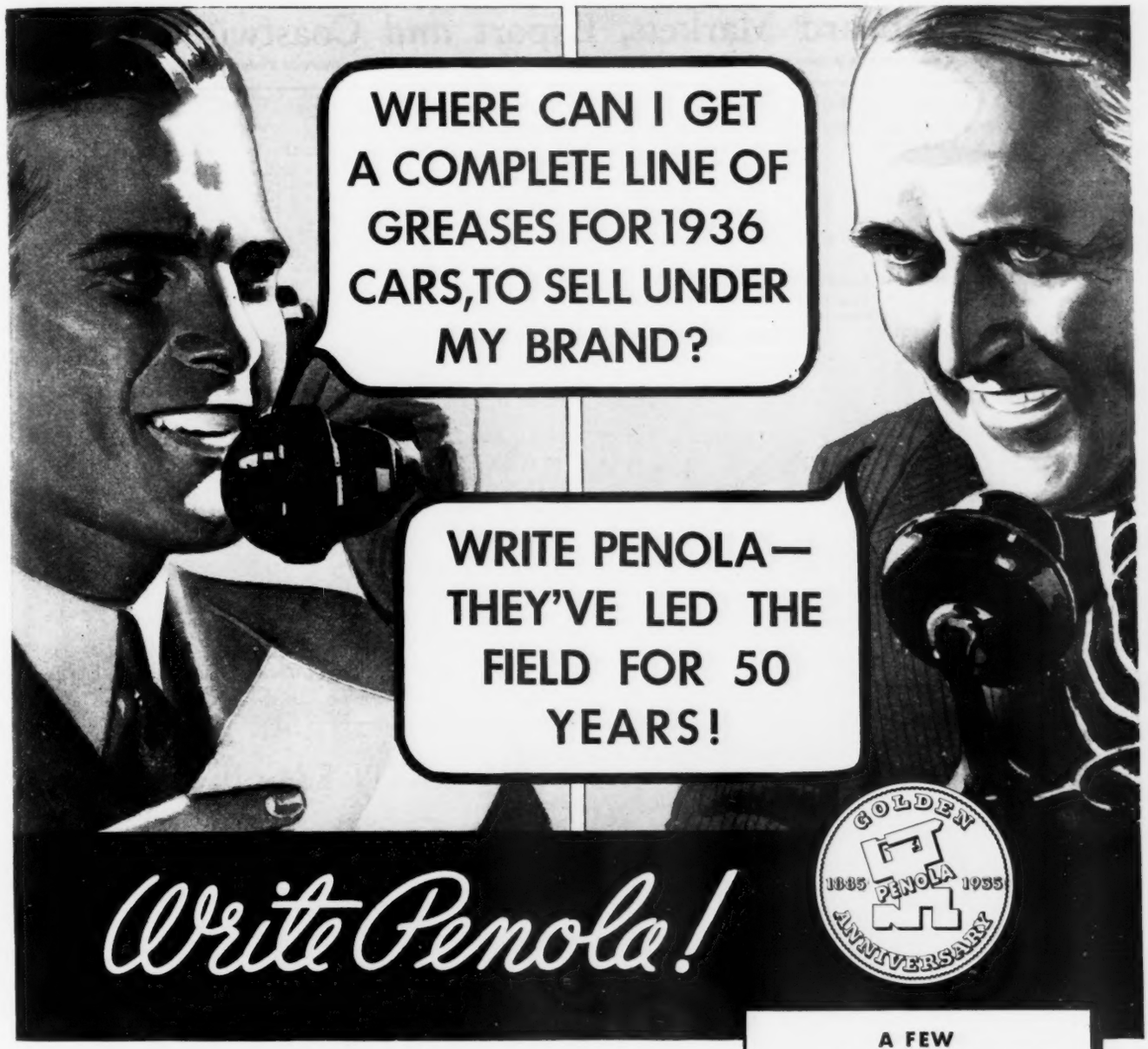
Gas and Bunker Oils

For Domestic and/or Export Shipment

*26-30 translucent gas oil	3.125– 3.25	3.125– 3.25	3.125
*30 plus translucent gas oil	3.125– 3.25	3.125– 3.25	3.125
*30 plus transp. gas oil	3.25	3.25	3.125– 3.25
Diesel Oil Ships' bunkers	†$1.50	†$1.50	†$1.50
Grade C bunker oil, for ships' bunkers, per bbl.	†$0.80	†$0.80	†$0.80
Grade C bunker oil, per bbl. in cargoes	$0.70	$0.70	$0.70

*Less than ½ of 1% sulphur. †Lighterage 5c per bbl. additional.

(*Continued on page 74*)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won't cake, harden, or separate

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Seaboard Markets, Export *and* Coastwise

Where $ mark is shown, prices are per barrel of 42 U. S. gallons. ***Prices Do Not Include Federal Tax***

(Continued from preceding page)

Mexican Crude and Bunker Oils

(F.o.b. Steamer, Tampico)

Prices—	Nov. 11	Nov. 4	Oct. 28
Heavy Panuco crude taxes to be paid, per bbl.	$0.88 -$0.90	$0.88 -$0.90	$0.88 -$0.90
Grade C bunker oil, ships' bunkers, taxes paid, per bbl.	$0.80	$0.80	$0.80

Mid-Continent Lubricating Oils

(Prices in cents per gallon in bbls. f.a.s. Gulf terminals. In drums and new barrels, 0.5c to 1c higher per gal. in some instances.)

190-200 vis. D 210 brt. stk.	25.00	24.50	24.00
150-160 vis. D 210 brt. stk.:			
0-10 pour point	22.50	22.00 -22.50	21.50 -22.00
10-25 pour point	22.00	22.00	21.50
25-40 pour point	21.50	21.50	21.00
150-160 vis. E 210 brt. stk.	21.50	21.50	21.00
120 vis. D 210 bright stock	21.00	21.00	20.50
180 vis. No. 3 color neutral oil:			
0-10 pour point	17.25 -17.50	17.25 -17.50	17.25 -17.50
15-30 pour point	16.25 -16.50	16.25 -16.50	16.25 -16.50
200 vis. No. 3 color neutral oil:			
0-10 pour point	17.75 -18.00	17.75 -18.00	17.75 -18.00
15-30 pour point	16.75 -17.00	16.75 -17.00	16.75 -17.00
600 s.r. olive green	12.00 -12.50	12.00 -12.50	12.00 -12.50
600 s.r. dark green	10.00 -10.50	9.25 -10.50	9.25 -10.50
631 s.r.	15.50	15.50	15.50

South Texas Lubricating Oils

(Viscosity at 100° F. pour test 0. Tanker, f.o.b. Gulf oil terminals, for export shipment)

***Unfiltered Pale Oils*:**

Vis. Color			
100 No. 3	5.50 - 6.00	5.50 - 6.00	5.50 - 6.00
200 No. 3	6.375- 7.00	6.375- 7.00	6.375- 7.00

South Texas Lubricating Oils (cont'd)

Unfiltered Pales (cont'd)

Prices—	Nov. 11	Nov. 4	Oct. 28
300 No. 3	7.00 - 7.50	7.00 - 7.50	7.00 - 7.50
500 No. 3½	7.875- 8.50	7.875- 8.50	7.875- 8.50
750 No. 4	9.00 - 9.50	9.00 - 9.50	9.00 - 9.50
1200 No. 4	9.50 -10.00	9.50 -10.00	9.50 -10.00
2000 No. 4	9.75 -10.25	9.75 -10.25	9.75 -10.25

***Red Oils*:**

Vis. Color			
100 No. 5-6	5.50 - 6.00	5.50 - 6.00	5.50 - 6.00
200 No. 5-6	6.125- 6.75	6.125- 6.75	6.125- 6.75
300 No. 5-6	6.75 - 7.00	6.75 - 7.00	6.75 - 7.00
500 No. 5-6	7.25 - 7.625	7.25 - 7.625	7.25 - 7.625
750 No. 5-6	9.00 - 9.50	9.00 - 9.50	9.00 - 9.50
1200 No. 5-6	9.50 -10.00	9.50 -10.00	9.50 -10.00
2000 No. 5-6	9.75 -10.25	9.75 -10.25	9.75 -10.25

Note: Red oil prices shown above cover oils with green cast; prices for blue cast red oils are slightly lower in some cases.

Tanker Rates

(Approximate tanker freight rates to Continental ports, in shipments per ton of 2240 pounds, British sterling: to U. S. ports, cents per barrel)

	Crude &/or Fuel		Refined Oil &/or Spirits	
Rates—Nov. 11	**Last Paid**	**Owners Ask**	**Last Paid**	**Owners Ask**
Calif. U.K./Continent*	14/	15/-16/	15/	15/3-16/3
Gulf-U.K./Continent*	12/9	13/-14/	15/6	16/-17/
Calif.-N. Atlantic (not E. of N. Y.)	46c	50-52c	42c	48-50c
Gulf-N. Atlantic** (not E. of N. Y.)	†27c	†27-29c	32c	33-34c

Note: Dirty boat quotations are enlarged to cover, "Fuel and Light Crude" quotations.

*Continental ports in range between Bordeaux and Hamburg, both inclusive

**Venezuela loading same rate: Tampico 2c to 3c per bbl. additional.

†Rates for heavy crude or fuel 1c to 2c higher than for light crude.

1936 Plymouth

(*Continued from page* 54)

for temperatures ranging from 40 to 110 F. For continued high speed driving, or for prevailing air temperatures from 70 to 110 F. an S. A. E. 40 is specified.

Winter crankcase oil requirements are as follows: For conditions where the minimum anticipated air temperature is 32 F. and the maximum is 80, an S. A. E. 20 or 20-W is recommended; with a minimum anticipated temp. of 10 F. and a maximum of 80, a 20-W only should be used; for an anticipated minimum and maximum of minus 10 and plus 45 F., a 10-W only is specified; between an anticipated minimum and maximum of minus 30 and plus 20, it is recommended that 10-W plus 10 per cent kerosine be used.

The transmission capacity, 2½ pints, is similar to the previous model. Lubricant requirements are also similar, with an S. A. E. 160 fluid gear lubricant being specified for summer, and an S. A. E. 90 for winter. For extreme winter, below zero, an S. A. E. 80 is recommended. The rear axle requirements and capacity are also similar to those of the 1935 model. The capacity is 3¼ pints, and it is specified that an S. A. E. 160 lubricant be used in summer and an S. A. E. 90 be used during the winter.

The Plymouth steering gear is of the worm and roller type with two tapered roller thrust bearings and a roller bearing on the roller tooth. The steering gear ratio is 18.2 to 1. Lubrication requirements specify an S. A. E. 160 fluid gear lubricant in summer, and an S. A. E. 90 for winter. It is suggested that engine oil may be added in extremely low temperatures.

Plymouth engineers emphasize the fact that only a water pump grease should be used to lubricate the water pump. The roller bearing universal joints require one ounce of special universal joint or fibre grease every 12,000 miles.

The cooling system has the same capacity as last year, 3¾ gallons. The fuel tank capacity also remains at 15 gallons.

North Dakota Jobbers To Meet Jan. 13-14

FARGO, Nov. 9. — The North Dakota division of the Northwest Petroleum Association will meet Jan. 13 and 14 in the Waldorf hotel, Fargo, Elwin E. Hadlick, association president, announced this week.

The division is returning to its former policy of meeting during the same week that the Minnesota division holds its convention.

Two years ago this policy was changed. The Minnesota division continued to meet in January. The North Dakota division changed its convention dates to June.

The Minnesota division's convention will be Jan. 16 and 17 at the Ryan hotel, St. Paul.

J. Edgar Pew Addresses Tulsa Purchasers

TULSA, Nov. 7.—Edgar Pew, Sun Oil Co., Philadelphia, and George A. Renard, New York, executive secretary of the National Association of Purchasing Agents, were the speakers at the third annual executives' night of the Purchasing Agents Association of Tulsa, held Nov. 5.

Mr. Pew, in discussing "Responsibility of a Purchaser from the Executives' Point of View," said that a buyer should have a thorough knowledge of materials and their uses; thorough understanding of the principal standards and specifications affecting his business; judgment in selecting materials best suited for the job, and courtesy and tact in advising superiors and associates.

Mr. Renard discussed "Intelligent Prudence in Buying," and urged executives to give greater recognition to the purchasers in their companies.

Hartol To Move Offices

NEW YORK, Nov. 8—The Hartol Products Corp. will move from its present location to new offices in the International Building of the Rockefeller Center group early in December, according to Frank C. Hart, president.

The move also will include the Hartol Products Corp. of New England and the Hartol Terminal Corp.

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NPN-11-13-35

CRUDE OIL MARKETS

Prices in $ per bbl. of 42 U. S. gals. at the well, A. P. I. gravity. Prices are effective as of 7 a.m. of dates as given.

Eastern Fields

Posted by Joseph Seep Purchasing Agency

(Effective Oct. 29, 1935, except Corning effective Oct. 2, 1933)

Penna. Grade Oil in Southwest Penna. Pipe Lines.....$1.87
Penna. Grade Oil in Eureka Pipe Lines (West Virginia).....$1.82
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O.).....$1.67
Corning Oil in Buckeye Pipe Lines (Ohio)..$1.32

Posted by Other Companies

Tide Water Pipe Co., Ltd.:
Bradford-Alleghany district (Penna. and N. Y.) (Effective Oct. 29, 1935).....$2.15
*The Pennzoil Co.: (Effective Oct. 29, 1935)
Penna. Grade Oil in National Transit Lines*$2.12
Ashland Oil & Transportation Co.:
Somerset Oil in Ashland Lines (Ky.) (Effective May 20, 1935).....$1.13

*The Pennzoil Co. posts $2.12 in Cochran, Franklin, Hamilton and Doolittle, Pa. fields; prices in other districts range down to $2.07 per bbl. at well.

Michigan

(Posted by Pure Oil Co.)

Midland, Midland County (Nov. 7, 1935)...$1.12

(Posted by Simrall Pipe Line Corp.)

(Effective Nov. 7, 1935)

West Branch.....$0.96
Crystal, Montcalm County.....$1.12

Central States Fields

Posted by Ohio Oil Co.

Effective Feb. 1, 1935)		(Effective May 22, 1935)	
Lima	$1.15	West. Kentucky	$1.13
(Effective Jan. 5, 1934)			
Princeton	$1.13	Illinois	$1.13

Canadian Fields

Posted by Imperial Oil Refineries, Ltd.

Western Ontario

(Effective Sept. 9, 1933)

Petrolia.....$2.10
Oil Springs.....$2.17

Alberta—Turner Valley

(Prices f.o.b. field tankage)

Crude:		Naphtha:	
Effective Dec. 9, 1933)		(Effective May 21, 1934)	
40-44.9	$1.50	†Clear	$2.31
45-49.9	2.07	†Discolored	$2.55
(Effective May 21, 1934)			
50 and above	$2.19		

†Clear naphtha: 22 color; 10 lbs. vapor pressure, Reid method; 90% recovery; end point, 410°, Discolored naphtha: same specifications as for clear naphtha except color.

Mid-Continent

Posted by Stanolind Crude Oil Purchasing Co.

(Effective Sept. 29, 1933)

In Oklahoma-Kansas)		(In North-North Central Texas)
Below 29	$0.84	$0.79
29-29.9	0.86	0.81
30-30.9	0.88	0.83
31-31.9	0.90	0.85
32-32.9	0.92	0.87
33-33.9	0.94	0.89
34-34.9	0.96	0.91
35-35.9	0.98	0.93
36-36.9	1.00	0.95
37-37.9	1.02	0.97
38-38.9	1.04	0.99
39-39.9	1.06	1.01
40 and above	1.08	1.03

Above Stanolind prices met as follows:

Sept. 29, by The Texas Co. in Oklahoma, and in North and North Central Texas; Continental Oil in all three states; by Empire, White Eagle and Gypsy (Gulf).

See also Carter Oil, Magnolia, Humble schedules below and footnotes under Carter table.

Posted by Carter Oil Co.

(In Oklahoma and Kansas)

(Effective Sept. 29, 1933)

Below 25	$0.76	33-33.9	$0.94
25-25.9	0.78	34-34.9	0.96
26-26.9	0.80	35-35.9	0.98
27-27.9	0.82	36-36.9	1.00
28-28.9	0.84	37-37.9	1.02
29-29.9	0.86	38-38.9	1.04
30-30.9	0.88	39-39.9	1.06
31-31.9	0.90	40 and above	1.08
32-32.9	0.92		

Sept. 29, Carter gravity and price schedule met in Oklahoma-Kansas by Sinclair-Prairie, and Humble price schedule met in North-North Central Texas except that Sinclair-Prairie posts five lower grades down to below 25, with 2c differential for each. Same day, Shell Petroleum met Carter in full in Oklahoma-Kansas.

Posted by Magnolia Petroleum Co.

(Effective Sept. 29, 1933)

In Oklahoma, same schedule as Carter Oil, which see above, beginning with below 25, at $0.76 and ending with 40 & above, at $1.08.

In Texas: North and North Central, including Burkburnett, Archer, Stephens, Henrietta, Electra, Comanche and Olden; and in Central Texas, including Mexia, Wortham, and Panola county, same gravity and price schedule as Stanolind in Texas, which see above, beginning with below 29 at $0.79, and ending with 40 and above, at $1.03.

†Posted by Humble Oil & Refining Co.

(*In North, North Central and Central Texas)

(Effective Sept. 29, 1933)

Below 29	$0.79	35-35.9	$0.93
29-29.9	0.81	36-36.9	0.95
30-30.9	0.83	37-37.9	0.97
31-31.9	0.85	38-38.9	0.99
32-32.9	0.87	39-39.9	1.01
33-33.9	0.89	40 and above	1.03
34-34.9	0.91		

*Including North Texas, Ranger, Mexia, Powell, Boggy Creek, Richland, Wortham, Currie and Moran fields.

†Effective Dec. 1, 1934, Humble prices are based on 99% tank tables at 60F. Allowance or deduction of 1% is made for each 25° change in temperature above or below 60F.

Panhandle Texas

Posted by Humble Oil & Refining Co.

(Effective Sept. 29, 1933)

	Gray County	Carson-Hutchinson
Below 35	$0.79	$0.69
35-35.9	0.81	0.71
36-36.9	0.83	0.73
37-37.9	0.85	0.75
38-38.9	0.87	0.77
39-39.9	0.89	0.79
40 & above	0.91	0.81

Sept. 29, above prices met by Sinclair-Prairie, Magnolia and The Texas Co. in the entire area, also by Continental Oil in Carson-Hutchinson.

East Texas

(Effective Sept. 29, 1933)

Stanolind, Humble, Sinclair-Prairie, Texas and Magnolia.....$1.00

West Texas and New Mexico

Posted by Humble Oil & Refining Co.

(Effective Sept. 29, 1933)

Ector, Pecos and Winkler Counties, W. Texas and Lea Co., N. M.....$0.75
Crane, Upton, Crockett, Howard and Glasscock county, W. Tex.....$0.70

Sept. 29, Magnolia met in Crane, Upton, Howard, Glasscock, Mitchell and Winkler. Sept. 29, Texas Co. met Humble in Winkler, Crane, Upton and Lea counties; Stanolind Oil & Gas met in Hendrich field, Winkler county and posted in Marion county, Tex. below 25 at $0.63, plus 2c differential to 40 & above at $0.95.

South and Southwest Texas

Posted by Humble Oil & Refining Co.

(Effective Sept. 29, 1933)

Darst Creek	$0.87	Pettus	$1.05
Salt Flat	0.87	Tomball	1.15
(Effective June 29, 1935)			
Saxet	$0.80	Mirando	$0.75
(Effective Aug. 20, 1935)			
Anahuac (Chambers county) and Dickinson (Galveston county)			
30-30.9	$0.94	36-36.9	$1.06
31-31.9	0.96	37-37.9	1.08
32-32.9	0.98	38-38.9	1.10
33-33.9	1.00	39-39.9	1.12
34-34.9	1.02	40 & above	1.14
35-35.9	1.04		

Sept. 30, The Texas Co. met Humble in Darst Creek. On Sept. 29 it posted $0.80 in Duval county and $0.85 in Saxet-Greta.

Oct. 2, Magnolia posted $0.87 in Darst Creek and $1.15 in Tomball; Sept. 29 it posted $0.75 in Luling and $0.95 in Lytton Springs; on July 3, 1935, $0.75 for Mirando. Jan. 11, 1934 $1.00 for Cleveland, Liberty county, Tex.; Aug. 8, 1935, $0.93 in Hardin, Liberty county, Tex.

Posted by Humble

Conroe *(Montgomery Co., Tex.)*

(Effective Sept. 29, 1933)

35-35.9	$1.09	38-38.9	$1.15
36-36.9	1.11	39-39.9	1.17
37-37.9	1.13	40 & above	1.19

Sept. 30 Texas Co. met above prices.

North Louisiana-Arkansas

Posted by Standard Oil Co. of Louisiana

(Effective March 17, 1934, except Homer, Smackover and Nevada county, Sept. 29, 1933).

(In Caddo, Homer, Haynesville, Sabine, De Soto Sarepta, Carterville, El Dorado and Miller county)

Below 25	$0.71	33-33.9	$0.89
25-25.9	0.73	34-34.9	0.91
26-26.9	0.75	35-35.9	0.93
27-27.9	0.77	36-36.9	0.95
28-28.9	0.79	37-37.9	0.97
29-29.9	0.81	38-38.9	0.99
30-30.9	0.83	39-39.9	1.01
31-31.9	0.85	40 and above	1.03
32-32.9	0.87		

Smackover, Ark.....$0.70
Nevada, Ark.....0.60
Urania, La. (La. Oil Refg. Co., Jan. 1, '34)...0.87

*Gulf Coastal Fields

Posted by Humble Oil & Refining Co.

(Effective Sept. 29, 1933)

Below 20	$0.82	27-27.9	$0.98
20-20.9	0.84	28-28.9	1.00
21-21.9	0.86	29-29.9	1.02
22-22.9	0.88	30-30.9	1.04
23-23.9	0.90	31-31.9	1.06
24-24.9	0.92	32-32.9	1.08
25-25.9	0.94	33-33.9	1.10
26-26.9	0.96	34 and above	1.12

Refugio heavy (Effective June 29, 1935).....$0.80

Effective Dec. 1, 1934 Humble prices are based on 99% tank tables at 60 F. Allowance or deduction of 1% is made for each 25° change in temperature above or below 60 F.

*Includes these fields: Barbers Hill, Goose Creek Hull, Humble, Liberty, Moss Bluff, Orange, Pierce Junction, Rabbs Ridge, Raccoon Bend, Refugio light, Sour Lake, Spindletop, Sugarland, and West Columbia.

Above prices met Sept. 29 by Sinclair-Prairie and Sun Pipe Line Co.

Posted by The Texas Co.

(Effective Sept. 30, 1933)

Same gravity and price schedule as Humble up to 30-30.9 gravity, which see; plus these grades.

30-30.9	$1.04	36-36.9	$1.10
31-31.9	1.05	37-37.9	1.11
32-32.9	1.06	38-38.9	1.12
33-33.9	1.07	39-39.9	1.13
34-34.9	1.08	40 and above	1.14
35-35.9	1.09		

Partlavaca (Tex. Gulf effective May 17, 1935).$0.80

Rocky Mountain Fields

Posted by Stanolind Oil & Gas Co.

(Effective Sept. 29, 1933)

Salt Creek and Dutton Creek, Wyo. Same schedule as Stanolind posts in Oklahoma-Kansas which see on first crude price page.

Elk Basin, light.....$1.16
Grass Creek, light.....1.18
Grass Creek, heavy.....0.62
Greybull-Torchlight.....1.18
Iles, light, Col.....0.96
Iles, heavy.....0.90
Hogback, N. M.....1.11
Frannie light (Effective May 1, 1934).....0.70
Frannie heavy.....0.62

Posted by Ohio Oil Co.

(Effective Sept. 29, 1933)

Elk Basin, Wyo.....$1.18
Grass Creek, light.....1.18
Rock Creek.....1.02
Big Muddy.....1.01
†Sunburst, Mont. (Effective July 19, 1935)...1.20

†Met by Texas Co. July 19.

Posted by *International Refining Co.

(Effective May 23, 1934)

Cutbank, Mont.....$1.45

*Texas Co. subsidiary

(Continued on next page)

New Refining Patents

Conversion catalyst. No. 2 011 385, issued Aug. 13, 1935; filed April 27, 1932; C. C. Towne, assignor to The Texas Co.

FORMATION of tar and carbon during conversion or reforming of normally gaseous hydrocarbons is prevented by mixing with the gases at or during the reaction or soaking period a fixed amount of selenium vapors. The most beneficial action of selenium is obtained by introducing the selenium after the heating operation and before or during the digestion or soaking stage.

One form of suitable apparatus is illustrated. Either solid selenium, an alloy of selenium, such as iron selenide, or a solution of dissolved selenium is used in such quantities as to constitute 0.5 to 10 per cent of the total volume of gases entering the reaction chamber.

Five claims substantiate the above.

* * *

Gum formation. No. 2 011 556, issued Aug. 13, 1935; filed Oct. 17, 1933; D. W. Hoge, assignor to C. P. Ritter.

FORMATION of gummy constituents in hydrocarbons is prevented by contact with a certain combination of dissimilar metals. These metals are copper, aluminum, and zinc, preferably, but not necessarily, arranged in the order named. The metals are each alloyed with about 30 to 50 per cent of their weight of manganese to diminish corrosion.

In practice, the plates of fractionating columns are made of these metals, arranged so that the aluminum plate is between the copper and zinc plates. An accompanying diagram illustrates their construction.

Four claims are made.

* * *

Cracking. No. 2 014 350, issued Sept. 10, 1935; filed April 15, 1931; E. E. Ayres, assignor to Gulf Refining Co.

CRACKING in an atmosphere of hydrogen but under conditions of temperature, pressure, and catalysis distinctly unfavorable to hydrogenation. Conveyance of heat from the walls to the vapor is much facilitated because of the mobility of the hydrogen molecule and because of the high specific heat of hydrogen as compared with hydrocarbon vapors.

Circulating fixed gas contains sufficient free hydrogen to make the weight of free hydrogen not less than one-half of one per cent of the weight of the oil with which it is in contact.

In practice the preferred pressure is between 1000 and 5000 pounds per square inch and the cracking temperature is between 800° and 1050° F. Prompt cooling of the oil-hydrogen mixture prevents hydrogenation at favorable temperatures.

An accompanying diagram shows an assemblage of apparatus useful in the performance of the process. Five claims substantiate the above description.

* * *

Stabilization. No. 2 014 200, issued Sept. 10, 1935; filed Feb. 4, 1933; F. B. Downing and H. W. Walker, assignors to E. I. du Pont de Nemours & Co.

AN OBJECT is to provide gum inhibitors which are insoluble in water and have no tendency to discolor the motor fuel. A 2:3:4:5 tetra alkyl-l-hydroxy benzene or a 2:3:5:6: tetra alkyl-l-hydroxy benzene may be used. Among the compounds which have been found particularly satisfactory are the following:—2:3:4:5 —tetramethyl-l-hydroxy benzene, 2:3:5:6—tetramethyl-l-hydroxy benzene, 2:3:4:5—tetra-

(Continued on page 81)

Crude Price Changes

PITTSBURGH—On Nov. 7 the Pure Oil Co. advanced Michigan crude 10 cents, making new price of Midland $1.12 per barrel at the well. Last previous change was a 12 cent advance Sept. 30, 1933.

MT. PLEASANT, Mich.—On Nov. 7 Simrall Pipe Line Corp. advanced Michigan Crude 10 cents, to: Crystal, Montcalm county, $1.12; and West Branch, $0.96 per barrel. Last previous change on West Branch was a 16 cent cut on Apr. 1, 1934. Crystal was first posted Mar. 28 last.

CRUDE OIL MARKETS

Continued from preceding page

CALIFORNIA, Posted by Standard Oil of California

All gravities above those quoted take highest price offered in the field. Effective Nov. 1, 1935*

Gravity	Signal Hill	Seal Beach Alamitos Heights	Huntington Beach	Inglewood	Playa Del Rey	Olinda-Brea Canon	Athens-Rosecrans Dominguez	Elwood Terrace	Torrance	Richfield	Whittier-La Habra	Montebello	Coyote Hills	Santa Fe Springs	Newhall McKittrick Kern River	Mountain View	Midway Sunset Elk Hills Buena Vista Hills	Lost Hills	Coalinga	Wheeler Ridge	*Santa Paula (Union Oil Co.)	*Orcutt (Union Oil Co.)
14-14.9	$0.75	$0.74	$0.73	$0.74	$0.75	$0.71	....	....	$0.75	$0.71	$0.71	$0.72	$0.72	....	$0.65	....	$0.65	$0.65	$0.65	....	$0.65	$0.65
15-15.9	.75	.74	.73	.74	.75	.71	....	....	.75	.71	.71	.72	.72	....	.65	....	.65	.65	.65	....	.65	.65
16-16.9	.75	.74	.73	.74	.75	.71	....	....	.75	.71	.71	.72	.72	....	.65	....	.65	.65	.65	....	.65	.65
17-17.9	.75	.74	.73	.74	.75	.71	....	....	.75	.71	.71	.72	.72	....	.65	....	.65	.65	.65	....	.65	.65
18-18.9	.75	.74	.73	.74	.75	.71	....	....	.75	.71	.71	.72	.72	....	.65	....	.65	.65	.65	....	.65	.65
19-19.9	.75	.74	.73	.74	.75	.71	....	....	.75	.71	.71	.72	.72	....	.65	$0.65	.65	.65	.65	$0.65	.65	.65
20-20.9	.75	.74	.73	.74	.75	.71	....	....	.75	.71	.71	.72	.72	....	....	.65	.65	.65	.65	.65	.65	.65
21-21.9	.75	.74	.73	.74	.76	.71	....	....	.75	.71	.71	.72	.72	$0.73	....	.65	.66	.67	.65	.65	.65	.65
22-22.9	.75	.74	.73	.75	.78	.72	....	....	.75	.71	.71	.72	.72	.73	....	.65	.67	.68	.66	.65	.65	.65
23-23.9	.75	.74	.74	.76	.79	.73	$0.75	....	.76	.71	.72	.73	.72	.73	....	.65	.69	.70	.67	.65	.65	.65
24-24.9	.77	.74	.75	.77	.81	.74	.75	....	.77	.72	.74	.74	.73	.73	....	.65	.71	.71	.69	.65	.65	.65
25-25.9	.78	.75	.76	.78	.82	.75	.76	....	.78	.73	....	.75	.74	.73	....	.66	.72	.73	.70	.66	.66	.65
26-26.9	.79	.76	.78	.79	.83	.76	.77	....	.79	.74	....	.76	.75	.73	....	.67	.74	.74	....	....	.66	.66
27-27.9	.80	.78	.79	.80		.77	.79	....	....	.75	....	....	.77	.74	....	.68	.76	.76	....	....	.67	....
28-28.9	.81	.79	.80	.81		.79	.80	....	....	.76	....	....	.78	.75	....	.70	.77	.77	....	....	.67	....
29-29.9	.82	.81	.81	.82		....	.82	....	....	.78	....	....	.79	.77	....	.71	.79	.78	....	....	.68	....
30-30.9	.83	.83	.82	.83		....	.83	....	....	....	....	....	.80	.78	....	.72	.81	.80	....	....	.69	....
31-31.9	....	....	....	.84		....	.84	....	....	Kettleman Hills			.81	.79	....	.74	.83	....	....	....	....	....
32-32.9	....	....	....	.85		....	.86	....	....				.82	.81	....	.75	.84	....	....	....	....	....
33-33.9	....	....	....	....		....	....	$0.84	....	....	$0.81	....	.83	.82	....	.76	.86	....	....	....	....	....
34-34.9	....	....	....	....		....	....	.85	....	....	.83	....	.85	.83	....	.77	....	....	....	....	....	....
35-35.9	....	....	....	....		....	....	.86	....	....	.84	....	....	.85	....	....	....	....	....	....	....	....
36-36.9	....	....	....	....		....	....	.88	....	....	.86	....	....	.86	....	....	....	....	....	....	....	....
37-37.9	....	....	....	....		....	....	.89	....	....	.87	....	....	.87	....	....	....	....	....	....	....	....
38-38.9	....	....	....	....		....	....	....	....	....	.88	....	....	.89	....	....	....	....	....	....	....	....
39-39.9	....	....	....	....		....	....	....	....	....	.90	....	....	....	....	....	....	....	....	....	....	....

F.O.B. Standard Pipe Line

*Union Oil prices effective Nov. 5, 1935. Union Oil prices in fields where it purchases meets all above Standard prices, except that it posts up to 40-40.9 gravity on Athens-Rosecrans-Dominguez, beginning with $0.87 for 33-33.9, plus 1c differential, to 40-40.9 at $0.94; and it posts three lower grades on Kern River-McKittrick-Mt. Poso as follows: 11-11.9, $0.59; 12-12.9, $0.61; and 13-13.9, $0.63.

ZERO-LUX

REG. TRADE MARK

B'lo ZERO MOTOR OIL

"ZERO-LUX" is a full bodied motor oil which will lubricate at 20 deg. BELOW ZERO, and is just as safe in mild temperatures as it is in sub-freezing weather.

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Write for particulars.

PENNSYLVANIA PETROLEUM PRODUCTS CO.

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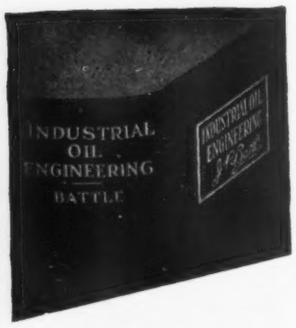
Water & Morris Sts.,
Philadelphia, Penna.



THIS is the third revised edition of INDUSTRIAL OIL ENGINEERING by J. R. Battle. The author is a well known mechanical engineer who has studied the lubrication needs of all types of machinery.

The book contains 1,100 pages of tables, charts, requirements and other information on lubrication and industrial oils. Tells you the most efficient utilization of oil products and equipment; the saving of power and elimination of oil waste.

INDUSTRIAL OIL ENGINEERING is the most complete work written on lubrication. It is valuable to every oil man interested in lubricating oils and their use. Price $10.

Send check for your copy today

NATIONAL PETROLEUM NEWS
1213 West 3rd St. Cleveland, Ohio

Interesting TRADE ITEMS

Automotive Industry

British manufacturers' figures show that only five American cars were built in greater numbers than their Morris whose production for the first six months of this year exceeded 100,000. The scheduled production of the balance of the year will exceed 50,000 which is a sales record for all time, it is said. Records show that 50 per cent of British car production is exported to the colonies. The data has been furnished by Champion Spark Plug Co., Toledo, which is now planning to establish factories in England and France.

* * *

Tire for Mud Service

A new passenger car tire designed especially for off-pavement service in mud and snow is announced by The B. F. Goodrich Co. The tire can be used on nearly 200 automobile models, including nearly every model from 1926 to 1935. The new product is intended for rural districts having the toughest road conditions.

* * *

Corrugated Fibre Boxes

"Xmas Merchandise Ideas" is the title of a special Christmas portfolio produced by The Hinde & Dauch Paper Co., Sandusky, Ohio, which ilustrates a group of merchandising suggestions—each made of corrugated fibre board. Requests should be addressed to the Advertising Department.

* * *

Trailers

Harvey C. Fruehauf, president of Fruehauf Trailer Co., in view of recent rumors, announces that no trucking operator has any financial interest in the company and that no change in the control or executive personnel has been made for years nor is contemplated.

* * *

Carbide Residue

The Linde Air Products Co., New York, has available on request a 20-page booklet entitled "The Utility of Carbide Residue." It explains in detail how owners of acetylene generators may capitalize on this residual by-product.

Formulas and hints for the preparation and utilization of various covering agents and construction materials such as whitewash, fireproof cement, mortar, plaster, concrete, or stucco, are given, as well as industrial uses as an oil and dirt scavenger, as a cleaner for drainage pipes, as a brake and clutch dressing for machinery, and as an ingredient in boiler lagging. There are also a number of agricultural uses given.

* * *

Technical Bulletin

Acheson Colloids Corp., Port Huron, Mich., has issued a new technical bulletin P242 pertaining to the application of colloidal graphite to lubrication in industry. Copies are available to interested inquirers.

* * *

Rhymes Advertise Lubes

Up-to-date nursery rhymes aimed to remind motorists of the necessity for discarding last summer's motor oil and changing to new winter grade Gulflube are to appear in the advertising of Gulf Refining Co., Pittsburgh beginning Oct. 30.

* * *

Fleet Efficiency

"Ten Ways of Getting More Work Out of Motor Trucks," a 16-page booklet on truck management has just come to us from The Service Recorder Co., Cleveland. A free copy is available on request. It contains graphic charts and discusses routing, scheduling, how to check speeding, overtime and costly delays, how to get "that extra trip per day."

* * *

Stainless Steel Movie

Republic Steel Corp., Youngstown, Ohio, announces early releases of the first sound picture on the manufacture and application of stainless steel, beginning with the mining of its principal component parts. After the production story has been told, the film depicts the more important phases of fabrication into products in widely varying fields of usefullness.

* * *

New Island Light

Developed primarily for pump island lighting in the filling station, a new island light in sizes from 300 to 500 watts is announced by the Westinghouse Electric & Mfg. Co., Pittsburgh. The light is constructed of porcelain enamel and can be mounted on a 2-inch pipe island standard.

* * *

Spark Plugs

The reason why so many cars lack reserve power for emergencies may be traced to faulty ignition, O. C. Rohde, chief engineer, Champion Spark Plug Co. points out in a recent statement. What usually happens when an at-

tempt to utilize that reserve for an extra spurt of speed results in sluggish action, is that the spark plug has been heated beyond its point of maximum efficiency by a slight leakage of cylinder gas. This may cause either pre-ignition, which kills all possibility of quick acceleration, or make the normally non-conducting insulator core to some extent an electrical conductor, thus weakening the spark.

The company has therefore directed research work in this direction and is announcing a new "dry powder seal" now employed in plugs used on 1936 model cars to attain a permanent, gas-tight seal around the center electrode wire.

* * *

Welded Vessel Construction

The all-welded method of steel hull construction, said to have been introduced on our inland waterways and pioneered by the Ingalls Iron Works Co., Birmingham, has been given enthusiastic study by marine engineers. All welded joints are stronger than the parent metal, eliminate distortion and the weakening of plates through hole punching and have a greater effciency than riveting, it is claimed. Corrosion at welded joints is impossible, it is pointed out, and the smooth, easily cleaned surfaces are particularly advantageous for the transportation of liquids.

* * *

Dinosaur Stamps

Dinosaur stamps, made from orlginal paintings, are being distributed free by the Sinclair Refining Co. through its dealers. Twenty-four stamps in all have been prepared and published. An explanatory text for the dinosaur stamp album has been prepared by Dr. Barnum Brown, curator of fossel reptiles of the American Museum of Natnral History in New York.

* * *

T. H. Smoot, chief engineer of Fluid Heat division of Anchor Post Fence Co., Baltimore, underwent an operation Sept. 25 at Baltimore. Outside of a setback a week following, he is making splendid progress toward recovery, it is reported.

* * *

The Owens-Illinois Glass Co., Toledo, announces the appointment of Smith L. Rairdon as eastern sales manager with headquarters at the company's branch office in New York. Mr. Rairdon has for some years been manager of the company's pharmaceutical and proprietary division.

* * *

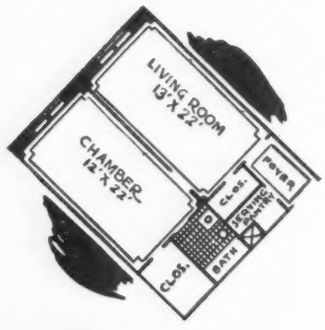
C. J. Tagliabue Mfg. Co., Brooklyn, announces the appointment of E. D. Wacker as assistant general sales manager. A considerable portion of Mr. Wacker's time will be spent in the field contacting sales representatives and jobbers.

AN IMPORTANT STEP-
1935
A GOOD PUMP
MADE BETTER
with the
New
BOWSER
INTERLOCKED
ZERO-SET
INSURES PROTECTION
With Zeroset, the hands of the recording dial must be set at zero before the pumping mechanism can be started--a most important feature in the program of increasing sales and building customer confidence at the service station!
1936
In a long list of steps--
SENSATIONALLY NEW
and PROGRESSIVE--
steps to be announced.
S.F.BOWSER & CO., Inc.
FORT WAYNE, IND.

5 BLOCKS FROM RADIO CITY

NEW YORK'S BEST HOTEL VALUE

2 room suites at the price of most single rooms.



$5 PER DAY

FOR THIS BEAUTIFUL TWO ROOM SUITE

1 or 2 persons

LARGEST SINGLE ROOMS IN NEW YORK $3.50

All rooms equipped with radio, combination tub and shower bath and circulating ice water. Swimming pool and gymnasium free to guests.

VISIT THE FAMOUS

COCOANUT GROVE

ROOF GARDEN

DINING — DANCING — FLOOR SHOW

The Park Central

56th St. at 7th Ave.

Britain's First Hydrogenation Plant Officially Opened by MacDonald

LONDON

THE opening of the coal hydrogenation plant of Imperial Chemical Industries, Ltd., at Billingham-on-Tees, by Ramsey MacDonald, constitutes one of the most important industrial events that has taken place in the United Kingdom since the war. Hydrogenation will make it technically possible to render the United Kingdom independent of imported oil supplies, he said.

The new plant is said to be the first in the world to make gasoline on a commercial scale by hydrogenation of bituminous coal. Delivery to distributing companies began in April from a tar unit and in June from a coal unit. The plant in full production, will make 45 000 000 gallons per annum—two thirds from coal, consuming nearly 4000 tons daily, and one third from tar products. A ratio of four tons of coal to one ton of gasoline can be maintained, it is said. Arrangements were made at the same time for marketing through existing oil companies.

In 1933 the British government announced the Hydrogenation Oils Production Bill, which guaranteed a preference on home-produced light oils for a period of years. The period from April, 1935, is four and a half years if the preference remains at the present rate of 8d. (16 cents) per gallon, and in proportion for other amounts of preference.

During the plant erection the total employoment rose from 7000 to 13,600, almost entirely on construction work. Of the 9500 workmen now employed, about 2000 are engaged in gasoline manufacture, and necessary services and research. The extra coal consumption corresponds to the employment of 2000 miners.

In the process, the raw coal is cleaned to less than 2.5 per cent of ash and ground up with oil previously made in the process to make a 50 per cent coal-in-oil paste. This is injected against the working pressure of 250 atmospheres (3700 pounds per square inch) and mixed with hydrogen. The mixture is heated up to reaction temperature and liquefaction of coal takes place at 450° C. (850° F.) and 250 atmospheres pressure.

A small heavy oil fraction containing the unconverted coal (five per cent by weight) and ash is treated for oil recovery and the coke residue is used as fuel. The major part of the coal is transformed into lighter oils which are vaporized, and are recovered on cooling the gaseous products leaving the converters. The crude oil so obtained is distilled into heavy oil, medium oil, and gasoline.

Heavy and medium oil are further hydrogenated; the latter in vapor phase converters in which the vaporized light oil and hydrogen are passed over a solid catalyst. The crude vapor phase product is distilled, the residual medium oil being separated from gasoline and treated again.

Cresote oil and low-temperature tars are either employed for making up the coal paste or distilled and the fractions introduced into the liquid or vapor phase stages as appropriate. These materials play no essential part in the main process of making oil from coal, but are conveniently treated along with the coal.

Ramsey MacDonald gave considerable credit to Dr. Bergius, who pioneered in this development and who was present at the opening ceremonies, and also to Sir Alfred Mond, first chairman of Imperial Chemical Industries, for whose vision he said Britain owes a debt as yet unknown. The revolution in power which Billingham marks will, like the invention of the steam engine, denote a new epoch in our industrial industry, he said.

Oil Dividends

Declared Last Week

Company	Amount	Record	Payable
Buckeye Pipeline q.	75c	Nov. 22	Dec. 14
McColl-Frontenac q.	20c	Nov. 15	Nov. 30
Standard of Indiana q.	25c	Nov. 16	Dec. 16
Union Tank Car q.	30c	Nov. 15	Dec. 2

Dividends Waiting Payment

Canadian Oil Cos. q.	12½c	Nov. 1	Nov. 15
Consolidated Oil pfd. q.	$2.00	Nov. 1	Nov. 15
Hancock Oil of Calif. "A"	25c	Nov. 14	Dec. 1
Hancock Oil of Calif. "B"	25c	Nov. 14	Dec. 1
Indiana Pipe Line s.	15c	Oct. 18	Nov. 15
Indiana Pipe Line extra.	5c	Oct. 18	Nov. 15
Mid-Continent Pet.**	25c	Nov. 1	Dec. 2
Ohio Oil*	15c	Oct. 31	Dec. 14
Ohio Oil pfd.	$1.50	Dec. 2	Dec. 14
Phillips Pet. q.	25c	Nov. 1	Nov. 30
Phillips Pet. extra.	25c	Nov. 1	Nov. 30
Seaboard Oil of Del. q.	15c	Nov. 30	Dec. 14
Seaboard Oil of Del. extra	10c	Nov. 30	Dec. 14
Standard of Calif. q.	25c	Nov. 15	Dec. 16
Standard of N. J. s.	50c	Nov. 16	Dec. 16
Standard of N. J. extra	25c	Nov. 16	Dec. 16
Sun Oil q.	25c	Nov. 25	Dec. 16
Sun Oil stock	7%	Nov. 25	Dec. 16
Sun Oil pfd. q.	$1.50	Nov. 9	Dec. 2

*Last paid 15c Sept. 1, '34.
**Paid 15c June 1, '35.

DALLAS, Nov. 6.—John F. Marion, aged 51, president of the royalty company bearing his name, died at his home here Nov. 6. Mr. Marion had headed the royalty owners' committee for the convention of the Independent Petroleum Association of America, which closed here Nov. 5.

New Refining Patents

(*Continued from Page 77*)

ethyl-l-hydroxy benzene, 2:3:5:6—tetraethyl-l-hydroxy benzene, and 3:5-dimethyl — 2:6-diethyl-l-hydroxy benzene.

Sixteen claims are made.

* * *

Steel alloys. No. 2 014 189, issued Sept. 10, 1935; filed Aug. 27, 1930; H. J. Schiffler, assignor to Vereinigte Stahlwerke Aktiengesellschaft.

CRACKING apparatus made of steel alloys containing a substantial proportion of chromium and negligible nickel. Chromium content varies from 5 to 13 per cent. An aluminum content of from 0.3 to 4 per cent also aids in increasing resistance to the action of sulfur and sulfur compounds. Further improvement is obtained by the addition of elements such as silicon, molybdenum, vanadium, titanium, and beryllium in quantities of from 0.1 to 2.0 per cent.

Two claims substantiate the compositions of the alloys.

* * *

Stabilization. No. 2 014 235, issued Sept. 10, 1935; filed Feb. 5, 1934; C. D. Lowry, Jr., assignor to Universal Oil Products Co.

UNREFINED corn oil is used as an inhibitor in unstable gasolines. The material is said to be readily available, inexpensive and effective not only as an inhibitor but also in other ways. The antioxidant action is attributed to sterols (sitosterol or phytosterol, in particular) which frequently comprise from 2.0 to 3.0 per cent of the crude oil. Amounts of corn oil varying from 1 to approximately 5 per cent are dissolved in the gasoline.

The major portion of the oil, which consists of fatty acid esters, performs a further useful function in that it asists in lubricating the top portion of the cylinders of the internal combustion engine.

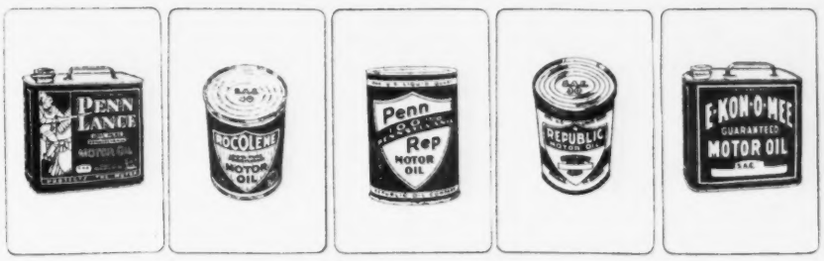
Ads to Give Temperature

NEW YORK, Nov. 12.—Ads which will give up-to-the-minute information on general weather conditions will be run in the fall and winter series by the Richfield Oil Corp. of New York. These ads will be pictorial and devoted to Richfield Hi-Octane gasoline and Richlube motor oil.

Fruehauf Enlarges Staff

The appointment of W. G. Retzlaff to the staff of the Fruehauf Trailer Co., in charge of sales engineering, is announced by G. W. Chamberlain, vice president and director of sales.

NOT TOO LATE TO GET REPUBLIC 10W—20W
WINTER GRADE MOTOR OILS



REPUBLIC MOTOR OILS

Supplied in all SAE Grades including 10W and 20W—bulk or packaged

ROCOLENE: High grade, made from best 100% Pure Penna. Crudes. Quality attest Permit 474 Penna. Grade Crude Oil Ass'n. Attractively packaged. Will meet the approval of your trade. Offers splendid opportunity for increased profits.

PENN-LANCE: Quality attest Penna. Grade Crude Oil Ass'n. Permit No. 765. Priced to meet present day markets. Gives exacting results for modern motors.

PENN-SHARP: Permit No. 876 Penna. Grade Crude Oil Ass'n attest to its quality. An efficient oil—priced right.

PENN-REP: 100% Penna. made from select Penna. Crudes. Warranted to meet the exacting requirement of the modern car.

REPUBLIC: Penna. blend from selected grade crudes, refined correctly for perfect lubrication. Attractive package. Both acceptance and demand exist for Republic.

E-KON-O-MEE: Manufactured from mixed base crudes with paraffine predominating. Ideal to meet the demand for a good reliable, serviceable oil, priced to meet competitive markets.

Republic's 10 W-20 W Winter grade motor oils meet the exacting demands of winter driving and conform to the rigid specifications of the S. A. E. and the recommendations of the car manufacturers.

Shipment in tank cars, drums or cans. Wire, phone, or write us NOW for your winter requirements.

Deep Water Terminals { Carteret, N. J. Norfolk, Va. Jacksonville, Fla. Cincinnati, O. Baltimore, Md. Hopewell, Va. Texas City, Tex. Pittsburgh, Pa.

REPUBLIC OIL COMPANY

THE INDEPENDENT SUPPLIER FOR THE INDEPENDENT JOBBER

Pittsburgh, Penna.

Republic Oil Company, Dept. I
Benedum Trees Bldg.
Pittsburgh, Pa.

Phone - - - Wire - - - Write - - - us

about your.....

Name..... Title.....

Concern.....

Street & No.....

City..... State.....

. . . *from* CHICAGO, ILL.

"In handling our jobber distributors we advise them in every instance to subscribe for NATIONAL PETROLEUM NEWS. We deem your publication as necessary in the oil business as a tank wagon or a station pump."

... *from* POTTSTOWN, PA.

"Keep me on your mailing list forever. I am engaged in marketing gasoline, kerosene and motor oils. NATIONAL PETROLEUM NEWS gives me an insight into my merchandising available in no other way except through your weekly."

...*from* PORT ARTHUR, TEX.

"I re-read parts of Colonel Burrell's refining articles two or three times a week. Have saved a lot of refining material appearing in the weekly issues of NATIONAL PETROLEUM NEWS."

. . . *from* DOTHAN, ALA.

"I have only been in the oil business about six months and there is no way of estimating the amount of help NATIONAL PETROLEUM NEWS has been to me. It has given me some wonderful ideas and I certainly recommend it to any one in the oil business."

. . . *from* OMAHA, NEB.

"My company won't buy it, but I've got to have it, so here is the money. Enter my subscription to NATIONAL PETROLEUM NEWS for another year."

...*from* KINGFISHER, OKLA.

"It's a fine magazine . . . worth its weight in gold. Frequently have held up buying a day or two until I got my NATIONAL PETROLEUM NEWS for quotations."

NATIONAL PETROLEUM NEWS

Published Every Wednesday

GENUINE, straight - from - the shoulder messages of oil men, telling how NATIONAL PETROLEUM NEWS helps them make more money.

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Send me the next 52 issues. Enclosed is $5.00, rate in U. S. Foreign Countries, $6.50; Canada, $7.50 including duty.

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St.-Box.....City-State.....

Position..... Company.....

New Patents

Prepared by R. E. Burnham, patent and trade-mark attorney, 511 Eleventh street, N. W., Washington, D. C., from whom copies may be obtained at the rate of 25c each. State number of patent and name of inventor when ordering.

October 29, 1935

REFINING

Process for treating oils—John C. Black, Los Angeles, Calif., assignor to Gasoline Products Co. Filed Oct. 13, 1926. No. 2,018,654.

Conversion of hydrocarbon oils—Charles H. Angell, Chicago, Ill., assignor to Universal Oil Products Co. Filed Apr. 17, 1931. No. 2,018,699.

Treatment of hydrocarbon oils—Carbon P. Dubbs, Chicago, Ill., assignor to Universal Oil Products Co. Filed June 1, 1931. No. 2,018,708.

Treating hydrocarbon oils with formaldehyde, a condensing agent, and acetic acid—Stewart C. Fulton, Elizabeth, N. J., assignor to Standard Oil Development Co. Filed Dec. 29, 1934. No. 2,018, 715.

Process of obtaining valuable products from hydrocarbon oils—Philip L. Young, New York, N. Y., assignor to Standard Oil Development Co. Filed Nov. 19, 1931. No. 2,018, 772.

Method and apparatus for vacuum distillation of liquids—Karl Ebner, Germany, assignor to American Lurgi Corp. Filed June 14, 1932. No. 2,018,778.

Production of high quality lubricating oils—Mathias Pier and August Eisenhut, Germany, assignors to I. G. Farbenindustrie. Filed Mar. 30, 1933. No. 2,018,871.

Conversion of hydrocarbon oils—Walter G. Whitman, Whiting, Ind., assignor to Standard Oil Co. (Ind.). Filed July 1, 1931. No. 2,018,986.

Process for partial oxidation of hydrocarbons—Stephen P. Burke, Plainfield, and Charles F. Fryling, Metuchen, N. J., assignors to Doherty Research Co. Filed Apr. 13, 1929. No. 2,018,994.

Manufacture of improved hydrocarbon products—Eugene Ayres and Herschel G. Smith, Swarthmore, Pa., assignors to Gulf Refining Co. Filed Mar. 10, 1932. No. 2,019,037.

Vapor phase cracking—Charles B. Buerger, Pittsburgh, Pa., assignor to Gulf Refining Co. Filed June 4, 1926. No. 2,019,070.

Refining hydrocarbons—Thomas T. Gray, Elizabeth, N. J., assignor to Gray Processes Corp. Filed Dec. 3, 1929. No. 2,019,184.

Art of and apparatus for converting hydrocarbons—William L. Gomory, Paris, France, assignor to Standard Oil Development Co. Filed Aug. 13, 1930. No. 2,019,448.

MISCELLANEOUS

Dispensing apparatus—Charles F. Waite, Stamford, Conn. Filed June 16, 1934. No. 2,018, 693.

Lubricating composition and process—Carleton Ellis, Montclair, N. J., assignor to Standard Oil Development Co. Filed May 3, 1932. No. 2,018,758.

Acetylation of liquid polyhydroxy aliphatic alcohols by means of a ketene—Per K. Frolich and Peter J. Wiezevich, Elizabeth, N. J., assignors to Standard Oil Development Co. Filed Mar. 5, 1932. No. 2,018,759.

Pyroxylin solution—William Seaman, Brooklyn, N. Y., assignor to Standard Oil Development Co. Filed Aug. 3, 1931. No. 2,018,767.

Process for preparing resins—Clarence R. Wise and David F. Edwards, Elizabeth, N. J., assignors to Standard Oil Development Co. Filed Sept. 19, 1931. No. 2,018,771.

Oil Trademarks For Copyright

THE following are trademark applications pertinent to our field pending in the United States Patent office which have been passed for publication and are in line for early registration unless opposition is filed promptly. For further information address National Trade-Mark Company, Munsey Building, Washington, D. C., trademark specialists.

As an additional service feature to its readers, this journal gladly offers to them an advance search free of charge on any mark they may contemplate adopting or registering. You may communicate with the Editor of this Department, or send your inquiry direct to the National Trade-Mark Company, stating that you are a reader of this journal.

LUBRIPLATE, Ser. No. 368,473. Fiske Brothers Refining Co., New York, N. Y. Filed Aug. 20, 1935. For Lubricating Oils and Greases.

GOLDEN SHELL, Ser. No. 369,109. Shell Oil Company, San Francisco, Cal. Filed Sept. 7, 1935. For Lubricating Oil.

DISPATCH, Ser. No. 369,128. Leon Frank, doing business as Gold Star Oil Co., New York, N. Y. Filed Sept. 9, 1935. For Lubricating Oils and Greases for Motor Vehicles, Hydraulic Brake Oils, Crank Case Oils, Shock-Absorber Oils and Penetrating Oils.

GAGE-O, Ser. No. 368,383. Clarence L. Ricklefs, doing business as The Petroleum Specialty Co., Los Angeles, Calif. Filed Aug. 16, 1935. For Chemical Paste for Liquid Level Indicators.

RED BIRD, and picture of a bird, Ser. No. 369,111. Southern Independent Oil and Refining Company, Inc., Evansville, Ind. Filed Sept. 7, 1935. For Insecticides, Fly Spray, and Stock Dip.

ROXOR, Ser. No. 366,963. The Roxor Corporation, Nashville, Tenn. Filed July 3, 1935. For Insecticides.

PICKWICK, and design, Ser. No. 366,711. Oscar Eisenstein, Brooklyn, N. Y. Filed June 27, 1935. For Furniture and Automobile Polish.

RENITE, Ser. No. 369,063. Harry M. Reynolds, doing business as Reynolds Sales Company, Columbus, Ohio. Filed Sept. 6, 1935. For Lubricants Containing Graphite with Oil, Water, or Other Vehicle.

PENN-ALTO, Ser. No. 368,911. Waverly Oil Works Company, Pittsburgh, Pa. Filed Aug. 31, 1935. For Lubricating Oil and Greases.

PARACREST, Ser. No. 367,036. Paragon Oil Company, Glendale, N. Y. For Lubricating Oil.

New Pressure Piping Code

NEW YORK, Nov. 9.—Copies of the new American Standard Code for pressure piping can now be purchased through the American Petroleum Institute.

Forty national organizations, including the Institute, co-operated with the American Standards Association in preparing the code, which is designed to serve as a guide to state and municipal authorities in drafting regulations for installing pressure-piping systems, it was stated. Oil, power, gas and air, and district heating pip'ng are covered in the code.

ESSO STATION

NOT CONNECTED With Standard Oil Company (Indiana)

Now motorists in the Middle West can obtain at Esso Stations in St. Louis:

ESSO—for Premium Motor Fuel
ESSOLENE—for Regular Motor Fuel
ESSOLUBE—for Motor Oil
ESSOLEUM—for Greases and Lubricants.

THE SIGN OF HAPPY MOTORING

For the past several years, motorists in the East and in the South have been familiar with "the ESSO sign". This big red, white and blue ESSO oval has marked the source of fine products and courteous service at more than 30,000 ESSO STATIONS and ESSO DEALERS from Maine to Louisiana.

ESSO INC.

Please Note That the Standard Oil Company (Indiana) HAS NO CONNECTION WITH ESSO STATIONS or ESSO Inc.

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Write today for information.

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World's largest advertising service organization
342 Madison Avenue - New York City

Transactions in Oil Stocks on New York Stock Exchange

1934 High	1934 Low	1935 High	1935 Low	Listed Shares	Par Value	Company	Current Dividend	Last Div. Paid	Transactions Week Ended Nov. 9 Sales Shares	High	Low	Last	Week's Change
55⅝	39	77¾	48½	788,675	N.P.	Amerada Corp.	50cQ	Oct. 31, 35	6,500	*77¾	75	75½	— ¼
40½	29½	40½	29¾	2,290,412	$25	Associated Oil Co.	45c	June 25, 35	20	38½	38½	38½	+ ¾
35¼	21½	28	20½	2,696,652	25	Atlantic Refining Co.	25cQ	Sept. 16, 35	24,600	24¾	23⅞	23¾	+ ⅝
10	5⅞	12	5⅞	2,258,779	5	Barnsdall Corp.	20c	Nov. 1, 35	84,800	*12	10½	11⅝	+ 1¼
9¾	5	9⅞	6¾	1,444,970	N.P.	Colonial Beacon Oil Co.	....	.....	250	*9⅞	8⅜	9⅞	+ 1⅛
14¼	7¼	10½	6½	13,996,072	N.P.	Consolidated Oil Corp.	25c	Oct. 10, 35	88,000	9⅞	9¼	9½	+ ¼
112⅛	108	112½	109	132,771	$100	do pfd.	$2Q	Aug. 15, 35	1,200	111½	110⅝	110⅝	+ ⅛
22¾	15¾	25¾	15⅛	4,722,652	5	Continental Oil Co.	25c	Oct. 31, 35	65,500	*25¾	24½	25¼	+ 1
23½	12	20¾	11¾	413,333	$10	General Asphalt Co.	....	.....	19,100	*20¾	18¾	19⅜	+ ¼
29¾	12½	17¾	9⅛	95,841	100	Houston Oil Co.	....	.....	.....	.....	.....	.....	.....
5⅝	2½	4⅜	1½	678,234	25	do v.t.c.	....	.....	10,600	4¼	4	4	— ⅛
4¾	2⅜	2¾	2⅛	1,207,132	10	Indian Refining Co.	....	.....	200	2¾	2¾	2¾	0
3⅜	¾	1⅞	⅜	1,309,060	N.P.	Louisiana Oil Ref'g. Corp.	....	.....	1,400	⅞	⅞	⅞	+ ⅛
23½	7¼	14½	4½	40,000	$100	do pfd.	....	.....	80	9½	9	9½	— ⅜
3¼	1⅛	3	1	330,000	N.P.	Maracaibo Oil Exploration Co.	....	.....	10,000	2½	1⅝	2¼	+ ½
14⅜	9⅛	16⅞	9⅛	1,857,912	$10	Mid-Continent Pet. Corp.	15c	June 1, 35	69,300	*16⅞	14	15	+ ⅝
15⅞	8½	14⅛	9¼	6,563,377	N.P.	Ohio Oil Co.	15c	June 15, 35	23,000	12	11¼	11½	+ ⅜
11½	10¾	12	10¾	4,699,885	$5	Pan Amer. Pet. & Transp. Co.	....	.....	100	11¾	11¾	11¾	+ ⅛
2½	⅜	1½	⅛	199,370	N.P.	Panhandle Prod. & Ref'g. Co.	....	.....	6,400	*1½	1	1¼	+ ⅛
21½	7	19½	6½	17,994	$100	do pfd.	....	.....	100	18½	17	18	0
14¼	8¼	11⅝	7⅝	2,153,444	5	Petroleum Corp. of America	33c	Oct. 31, 35	7,300	11⅝	11	11	— ⅜
20¾	13⅜	37⅝	13¾	4,439,450	N.P.	Phillips Petroleum Co.	25cQ	Aug. 30, 35	65,000	*37⅝	35½	35¾	+ ¾
1⅜	⅜	⅝	⅛	1,184,817	$25	Pierce Oil Corp.	....	.....	3,300	½	⅜	½	+ ⅛
10⅜	4½	6⅛	2⅜	150,000	100	do pfd.	....	.....	800	4½	4	4½	+ ½
2	¾	1⅞	⅝	2,500,000	N.P.	Pierce Petroleum Corp.	....	.....	4,100	1	⅞	⅞	— ⅛
16¾	7¼	12¼	6½	1,050,000	$5	Plymouth Oil.	25cQ	Mar. 30, 35	21,300	*12¼	11	11½	+ ⅛
14⅞	6⅛	12¼	5⅞	3,038,370	N.P.	Pure Oil Co.	....	.....	60,900	*12¼	11¾	12	+ ⅛
63	33½	99½	34¾	167,640	100	do 6% pfd.	....	.....	600	98	96	96	— 2
80	49	112	49⅝	130,000	$100	do 8% pfd.	....	.....	670	110¼	108¼	108¼	— 1¾
39⅛	28⅝	46⅛	29½	425,342	a	Royal Dutch Co. (N. Y. shares)	$1.70	Aug. 1, 35	1,100	*46½	45¾	45¾	— ¼
38⅜	20¾	35⅞	20¾	1,244,383	N.P.	Seaboard Oil of Del.	25cQ	Sept. 15, 35	12,900	33⅜	31	31½	+ 1
26½	19	38	20⅜	56,148	£2	Shell Transport & Trading Co.	$1.237	July 24, 35	.....	.....	.....	.....	.....
11½	6	13	5½	13,070,625	N.P.	Shell Union Oil Corp.	....	.....	25,000	*13	11¾	12	— ⅜
89	57	107¾	63½	400,000	$100	do pfd w.w.	....	.....	4,300	*107¾	104½	106	+ 2
17⅛	7¼	18¾	4⅞	461,000	10	Simms Petroleum Co.	**$1.25	Oct. 18, 35	6,100	5⅛	†4⅞	5	0
11½	6	17	6½	1,100,069	25	Skelly Oil Co.	....	.....	8,700	17	14	15	— 1⅜
68⅛	51½	106	60	120,000	100	do pfd.	....	.....	400	*106	103	104	0
19⅞	12½	15¾	10⅝	31,701,348	15	Socony Vacuum Oil Co.	15c	Sept. 16, 35	73,500	12⅜	12	12⅛	0
114	96½	116	111	764,925	100	S. O. Export Corp. pfd.	$2.50S.A.	June 29, 35	600	112⅞	112⅜	112⅜	— ⅝
42⅞	26½	38¾	27¾	13,102,900	N.P.	S. O. California.	25cQ	Sept. 16, 35	22,300	38¾	37⅜	37⅜	— ⅝
32¾	23¼	28⅜	23	15,215,677	$25	S. O. Indiana.	25c	Sept. 16, 35	22,300	28⅜	28	28⅛	+ ⅛
41	26	32	20	146,542	10	S. O. Kansas.	50c	Oct. 31, 34	800	23	22½	23	+ 1
50⅛	39¼	50½	35¾	25,740,965	25	S. O. New Jersey.	50c e.a.	June 15, 35	31,400	49½	48⅝	49⅜	+ ½
74¼	51½	75½	60½	1,590,406	N.P.	Sun Oil Co.	25cQ	Sept. 16, 35	3,700	74	72½	73	+ ½
118	100	121	115½	100,000	$100	do pfd.	$1.50Q	Sept. 3, 35	70	120½	120	120	— ½
3	1¼	3	1⅝	966,979	$1	Superior Oil Corp. (Del.)	....	.....	12,100	2¾	2⅜	2⅜	— ¼
29¾	19⅝	23¾	16½	9,851,236	$25	The Texas Corp.	25cQ	Oct. 1, 35	41,800	23¾	22⅝	23	0
6½	2½	9¼	3¼	930,570	10	Texas Pacific Coal & Oil Co.	....	.....	15,600	9	8⅜	8½	— ⅛
14⅜	8	12	7⅜	5,998,919	N.P.	Tide Water Associated Oil Co.	....	.....	37,600	12	10⅞	11⅜	+ ⅜
87	64½	103⅝	84	695,503	$100	do pfd C. T. V.	$1.50	Oct. 1, 35	1,300	101¾	101	101¾	+ ¾
40	24	43½	26¾	2,191,823	N.P.	Tide Water Oil Co.	50c	Sept. 30, 35	50	43½	43½	43½	+ 3½
20½	11½	20⅜	14¾	4,386,070	25	Union Oil of California.	25cQ	Nov. 9, 35	10,400	20¾	20¼	20½	+ ⅜
25¾	15⅝	26½	20¼	1,200,000	N.P.	Union Tank Car Co.	30cQ	Sept. 3, 35	2,900	23⅞	22½	23½	+ 1¼
3⅞	1	1⅜	⅝	759,538	N.P.	Warner Quinlan Co.	....	.....	1,900	⅞	¾	¾	— ⅛
5¾	2	2⅝	1	431,443	$5	H. F. Wilcox Oil & Gas Co.	....	.....	1,000	2⅛	2	2	— ⅛

*New high. †New low. x Ex-div. **Dividends of liquidation. ‡Stock dividend. a Par 33 1/3 florins.

Standard Oil Stocks on New York Curb Market

1934 High	1934 Low	1935 High	1935 Low	Shares Issued	Par Value	Company	Current Dividend	Last Div. Paid	Transactions Week Ended Nov. 9 Sales Shares	High	Low	Last	Week's Change
11	6	11⅛	6	36,000	$25	Borne Scrymser Co.	50c	Oct. 15, 35	.....	.....	.....	.....	.....
38	26	42	30½	200,000	50	Buckeye Pipe Line Co.	75cQ	Sept. 14, 35	400	41	40	41	+ 1½
150	116	157	115	120,000	25	Chesebrough Mfg. Co.	$1.50	Sept. 27, 35	100	125	125	125	— 5
14⅜	9⅛	23½	10	5,977,873	N.P.	Creole Petroleum Co.	....	.....	27,900	22½	21⅞	22⅛	+ ⅝
37	30	38	33¼	50,000	$50	Eureka Pipe Line Co.	$1Q	Nov. 1, 35	100	36	36	36	— 1
49⅛	33¼	64	44	8,968,479	N.P.	Humble Oil & Refg. Co.	25cQ	Oct. 1, 35	4,300	62¼	60⅛	61¼	+ 1⅝
17⅞	12⅝	22½	15⅝	26,919,871	N.P.	Imperial Oil Ltd.	‡25cS.	June 1, 35	13,200	22⅛	21⅛	21⅞	+ ⅞
17½	12⅜	22½	16¼		N.P.	do registered.	25cQ	June 1, 34	400	22⅛	21¾	22⅛	+ 1
6⅞	3¾	5¼	3⅜	300,000	$10	Indiana Pipe Line Co.	15c S.A.	May 15, 35	800	5¼	4⅞	5¼	+ ¼
33⅜	19⅝	39⅜	28	14,324,088	N.P.	International Pet. Co.	‡75cS.	June 1, 35	30,400	*39⅜	37⅝	38	+ ⅝
9½	7	10½	6¾	509,000	$12.50	National Transit Co.	35c	Dec. 15, 34	1,300	9½	9¼	9¼	0
4¾	3	4⅞	3	100,000	5	New York Transit Co.	15c S.A.	Oct. 15, 34	100	4½	4½	4½	+ ¼
7	4⅜	8	5¼	120,000	10	Northern Pipe Line Co.	25c S.A.	July 1, 35	800	*8	7½	8	+ ¾
91	83¼	107¼	90¼	562,122	100	Ohio Oil Co. pfd.	$1.50Q	Sept. 14, 35	400	104⅞	104½	104½	— ⅜
8½	3¾	11	5⅞	400,000	25	Penn Mex. Fuel Co.	....	Dec. 22, 33	200	6¾	6¾	6¾	— 1¼
5½	3½	5	3⅞	100,000	10	Southern Pipe Line Co.	15c	Sept. 3, 35	100	4½	4½	4½	+ ¼
26½	17½	29	21⅝	1,200,000	25	South Penn Oil Co.	30c	Sept. 30, 35	1,000	27¾	27	27	— ⅞
47	41	52½	45¼	35,000	50	South West Pa. Pipe Lines.	$1Q	July 1, 35	150	47¾	45½	45½	— 3¼
18⅛	14⅝	22	18	2,604,790	10	S. O. Kentucky.	25c	Sept. 14, 35	3,400	*22	21⅜	22	+ ⅝
16⅞	8¼	12	7¾	188,403	25	S. O. Nebraska.	....	June 20, 34	600	12	11½	11½	— ⅛
28½	12⅜	23⅜	11½	753,740	25	S. O. Ohio.	....	Apr. 16, 34	7,200	*23⅜	20¼	20¼	0
95	77½	99½	91	120,000	100	do 5% pfd.	$1.25Q	Oct. 10, 35	25	94¼	94¼	94¼	+ 1¼
4¼	2⅜	5¾	2¼	34,158	25	Swan Finch Oil Corp.	....	Dec. 1, 30	.....	.....	.....	.....	.....

*New high. †New low. ‡Imperial Oil Spec. 37½c June 1, 35. International Pet. Spec. 50c June 1, 35.
x Ex dividend.

Sixth Chek-Chart Issued

The sixth edition of Chek-Chart has been issued by the Chek-Chart Corp., 624 S. Michigan Ave., Chicago, covering all makes of passenger cars from 1931 to 1935 inclusive. Popular models of trucks, representing 93 per cent of truck registrations, are also included.

The new edition, 200 pages in loose leaf form, contains several changes. Notes and service instructions have been extended and expanded considerably. Lubrication diagrams have been made clearer and easy to read. Instructions in the front part have been fully revised and brought up to date to include all modern constructions.

The edition has been completely reset and revised to bring all older model cars in line with the manufacturers' present recommendations on lubricants.

Oil and Royalty Stocks on New York Curb

1934 High	1934 Low	1935 High	1935 Low	Par Value	Company	Transactions Week Ended Nov. 9 Sales Shares	High	Low	Last	Week's Change
1¼	⅜	¾	⅜	N.P.	American Maracaibo..	1,600	¾	⅝	¾	0
2⅞	1	3	⅝	N.P.	Arkansas Nat. Gas....	7,100	*3	2¼	2⅜	+ ⅛
2⅜	⅝	2⅞	⅝	N.P.	do A.....	36,200	2¾	2¼	2½	+ ¼
3⅞	1⅜	7	2¼	$10	do pfd.....	2,600	6¼	6⅛	6¼	+ ⅜
5⅛	12¾	16¼	14½	N.P.	British Amer. Oil coup.	100	15¾	15¾	15¾	+ ⅛
5½	1½	4¼	1⅝	$1¼	Carib Syndicate.....	35,200	3⅞	2⅝	2¾	+ ⅛
4¼	1¼	3¼	¾	N.P.	Cities Service.....	318,600	*3¼	2½	3	+ ⅜
6⅞	11¼	31½	6⅛	$100	do pfd.....	4,300	*31½	29¼	29½	— ½
2½	1⅛	3⅜	⅝	10	do pfd. B.....	700	*3⅜	3	3⅜	+ 1⅛
3½	9	30	6	100	do pfd. BB.....	.....	....	....	....	....
3½	⅛	2⅛	⅝	N.P.	Colon Oil Corp.....	2,800	1	⅞	13/16	— 1/16
1¾	⅛	1½	⅛	N.P.	Columbia Oil & Gas vtc.	6,300	1⅛	⅞	1	+ ⅛
2	1⅛	3	1	$1	Consolidated Royalty..	1,100	*3	2	3	+ 1
3⅞	½	⅞	¼	N.P.	Cosden Oil.....	500	⅜	⅜	⅜	+ 1/16
9	2½	2	¾	$100	do pfd.....	100	1⅜	1⅜	1⅜	— ⅛
1¼	¾	1½	⅝	N.P.	Crown Central Pet.....	6,700	1⅜	1¼	1¼	— ⅛
7½	4⅛	6¾	4	N.P.	Darby Petroleum.....	1,000	*6¾	5¾	6¾	+ 1¼
2¼	1	2	¾	N.P.	Derby Oil & Refg.....	200	1⅜	1⅜	1⅜	+ ¼
.....	.....	20	20	N.P.	do pfd.....	.....	....	....	....	....
76¼	50	74¾	50¼	$25	Gulf Oil Corp.....	9,900	69⅝	68	68	+ ¾
4½	1¼	4¼	1⅜	N.P.	Indian Ter. Illg. Oil A	100	2½	2½	2½	0
4½	1¼	4¼	1⅜	N.P.	do B.....	500	2⅝	2⅝	2⅝	+ ⅛
3	1⅜	3	1⅜	N.P.	Kirby Petroleum.....	2,400	2¾	2⅝	2⅝	— ⅛
⅞	⅛	¾	⅛	$25	Leonard Oil Dev.....	1,000	1/16	⅜	⅜	0
6	3⅜	6¾	3½	N.P.	Lion Oil Refg.....	1,600	*6¾	4⅞	5½	+ 1¼
8⅝	4¼	10⅞	4½	N.P.	Lone Star Gas.....	7,800	*10⅞	10¼	10½	+ ⅜
8¾	5¼	19	4	N.P.	Margay Oil Co.....	100	18	18	18	+ 4
2¼	1	2⅜	⅞	N.P.	Mexico-Ohio Oil.....	100	*2⅜	2⅜	2⅜	0
5	2⅝	3⅜	1⅞	N.P.	Michigan Gas & Oil....	800	3	2½	2¾	+ ⅛
2⅞	1	2¼	⅜	N.P.	Mid. States Pet. A vtc.	5,600	*2¼	1⅞	2¼	+ ⅝
1⅛	¼	⅝	¼	N.P.	do B vtc.....	1,700	1/16	1/16	⅛	+ ⅛
⅝	⅝	⅜	¼	$1	Mountain & Gulf.....	.....	....	....	....	....
5½	4	5½	4⅛	10	Mountain Producers...	1,600	5	5	5	— ⅛
18⅛	⅛	20	13½	N.P.	National Fuel Gas....	8,200	*20	18½	19⅛	+ ½
2½	1¾	3¼	2	$5	New Bradford Oil.....	100	2½	2½	2½	0
3⅜	1¾	3¼	2	N.P.	North Central Texas..	700	3¼	3⅛	3⅛	0
⅝	⅝	⅝	⅝	N.P.	North European.....	1,000	1/16	⅛	1/16	0
10⅝	8¼	12	9⅛	N.P.	Oil Stocks Ltd. A.....	200	*12	12	12	+ ¾
2⅝	⅛	3½	1¼	N.P.	Pantepec of Venezuela.	16,400	3⅜	3⅛	3⅜	+ ⅛
⅝	⅛	⅝	⅛	N.P.	Producers Royalty....	1,300	⅛	⅛	⅛	— 1/16
63	33½	70	34¾	$100	Pure Oil 6% pfd.....	.....	....	....	....	....
1½	¾	1	½	N.P.	Red Bank Oil.....	900	5/8	½	⅝	+ 1/8
1	⅛	¼	⅛	N.P.	Reiter-Foster Oil.....	600	¼	1/16	⅛	— 1/16
4	½	1½	½	$25	Richfield Oil pfd.....	100	¾	¾	¾	0
1¼	¾	4½	1	..	Root Petroleum.....	700	3⅛	2⅞	2⅞	+ ⅛
8¼	3½	12	4	10	do conv. pr. pfd...	.....	....	....	....	....
.....	.....	.....	.....	$10	Royalty Corp. pfd.....	.....	....	....	....	....
3½	⅛	1½	⅝	N.P.	Ryan Consolidated....	100	1⅛	1⅛	1⅛	0
1	⅛	1	⅛	$10	Salt Creek Consolidated	.....	....	....	....	....
7⅛	5	7½	5½	10	Salt Creek Prod.....	1,300	7	6¾	6¾	— ⅛
6	4⅛	6⅞	4¾	N.P.	Southland Royalty....	2,800	6½	6¼	6¼	0
2	⅜	2⅞	⅜	$5	Sunray Oil.....	12,100	2¾	2⅝	2½	— ¼
.....	.....	3⅜	2	$1	Swiss Oil Corp.....	700	2½	2⅜	2½	0
11	4⅜	6⅞	5	N.P.	Texon Oil & Land.....	2,500	6½	6⅛	6⅛	— ⅛
1⅛	⅛	3	⅛	$5	Venezuela Petroleum..	12,000	2⅛	1¾	1⅞	— ⅛
5¼	2¾	6⅛	3½	1	Woodley Petroleum...	1,400	5½	5¼	5¼	— ¼

†New high. †New low.

New York Bonds

Week Ended Nov. 9

	High	Low	Last	Change
Atlantic Refg. deb. 5s...	106½	106½	106½	0
Houston Oil 5½s '40....	100	97¾	100	+2¼
Pan Amer. Pet. of Calif. 6s	40	40	40	—1
Pan Amer. Pet. of Calif. 6s ctfs.....	41	39⅝	39⅝	—1⅜
Phillips Pet. 5¼s.....	101¼	101⅛	101⅛	— ⅛
Pure Oil 4¼s.....	104	103	103⅝	+ ½
Richfield Oil of Calif. 6s..	30⅛	29⅞	30⅛	—1⅛
Richfield Oil of Calif. 6s ctfs.....	30½	30	30	— ¼
Shell Union Oil 5s.....	104	103¾	103¾	— ¼
Skelly Oil 5½s.....	102¾	102¼	102½	— ¼
S. O. N. Y. 4½s.....	101⅛	101	101⅛	+ ⅛
Union Oil of Calif. 6s A..	119	118¼	119	+1
Union Oil of Calif. 4s....	115½	113¾	114	+ ½
Warner-Quinlan 6s.....	22½	21	22	+1

Completes Business Trip

Colonel W. F. Rockwell, president of the Pittsburgh Equitable Meter Co., the Merco Nordstrom Valve Co., Oakland, Calif., and the Timken Companies of Detroit, has just completed a trip from coast to coast, visiting the various plants operating under his direction. His optimism over present business conditions is shown by the fact that expenditures in the various plants which he heads have been authorized to the extent of over a million dollars.

Pittsburgh Stock Exchange

Transactions Week Ended Nov. 8, 1935

	Sales	High	Low	Last	Change Over Week
Ark. Nat. Gas....	300	3	2¼	3	+ ⅞
do pfd.....	300	6⅛	6⅛	6⅛	— ¼
†Cities Serv.....	1,096	3⅛	2½	3⅛	+ ⅝
Col. Gas & Elec...	3,827	15⅝	13⅛	15⅛	— ⅝
Devonian Oil....	50	15½	15	15	0
Lone Star Gas....	10,860	11½	10¼	10½	+ ¼
† do 6 p.c. conv. pfd.....	36	100⅜	100¼	100⅜	— ⅛
Mountain Fuel Supply.....	4,978	5⅞	5½	5½	— ¼
‡Phoenix Oil.....	2,940	.02	.02	.02	—.01
Plymouth Oil....	629	12¼	10½	11⅜	+ ⅞
Shamrock Oil & Gas.....	3,115	2½	1¾	2⅛	+ ⅛
†Standard Oil of N. J.....	540	49½	48¾	49⅛	+ ⅛

†Unlisted. ‡New low record.

Cleveland Stock Exchange

Transactions Week Ended Nov. 9, 1935

	Sales	High	Low	Last	Change Over Week
Canfield Oil.....	....	....	....	....	....
Nat'l Refining....	417	5¼	4⅞	5	0
do pfd.....	45	55	50	55	+10

New York Curb Bonds

Week Ending Nov. 9

	High	Low	Last	Change
Cities Serv. 5s '50.....	70½	67⅛	67¾	+ ¼
Cities Serv. 5s '66.....	69	66½	68	+ ½
Cities Serv. G. 5½s '42..	95	93½	94¾	+1½
Empire O & R 5½s '42..	77¼	74⅝	76⅛	+1⅝
Gulf Oil 5s '47.....	106	105¾	106	+ ¼
Valvoline Oil 7s '37.....	99	98	98	— ¼

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Taxed Gasoline Demand Gains 10.31% In August Over Year Ago

NEW YORK, Nov. 9

AN INCREASE of 163,069,000 gallons, or 10.31 per cent in gasoline consumption by motor vehicles was indicated for August this year over August of last year, in reports filed by wholesalers and dealers of gasoline under state gasoline tax or inspection laws in the various states, the American Petroleum Institute reports.

Consumption for August was 1,744,505,000 gallons, compared with 1,581,436,000 gallons in August, 1934 and with 1,718,003,000 gallons in July this year.

Daily average in August was at the rate of 56,274,000 gallons, or 5,260,000 gallons per day more than in August a year ago.

Only one state—New Jersey—reported a decrease in consumption. This was one of 2.15 per cent. All other states showed increases ranging from 0.98 per cent in the District of Columbia to 36.5 per cent in Colorado.

The five largest consuming states showed the following increases in demand in August over August a year ago: California, 13.16 per cent; Illinois, 9.36 per cent; New York, 16.60; Ohio, 5.48; and Pennsylvania, 3.86 per cent.

In the eight months ended August this year, consumption totaled 11,523,446,000 gallons, an increase of 649,421,000 gallons, or 5.97 per cent over consumption in the corresponding period of last year. In this period only one state reported a decrease, this being one of 0.82 per cent in Nebraska. Increases ranged from 0.14 per cent in Arkansas to 21.35 per cent in North Dakota.

Details are given in the accompanying table.

Gasoline Consumption By States, August, 1935

(Figures in Thousands of Gallons)

	July, 1935 Gallons	Month of Aug., 1935 Gallons	Aug., 1934 Gallons	% Change 1935 over 1934	8 Months Ended With Aug., 1935 Gallons	Aug., 1934 Gallons	% Change 1935 over 1934
Alabama	15,406	15,959	13,737	+16.17	111,421	99,888	+11.54
Arizona	7,088	6,966	6,110	+14.00	52,573	48,116	+9.26
Arkansas	13,348	13,705	12,929	+6.00	91,232	91,100	+0.14
California	144,328	128,854	113,863	+13.16	958,793	892,117	+7.47
Colorado	18,621	19,334	14,164	+36.50	121,161	111,779	+8.39
Connecticut	28,145	29,341	26,205	+11.97	176,174	166,182	+6.01
Delaware	4,159	5,115	4,352	+17.53	29,560	27,189	+8.72
Dist. of Col.	10,593	10,488	10,386	+0.98	73,798	68,930	+7.06
Florida	19,496	19,673	16,970	+15.93	176,209	156,989	+12.24
Georgia	23,698	24,322	21,626	+12.47	172,933	154,782	+11.73
Idaho	7,448	8,754	7,285	+20.16	46,158	43,247	+6.73
Illinois	104,160	108,917	99,589	+9.37	698,322	670,445	+4.16
Indiana	47,577	48,589	43,876	+10.74	322,972	299,222	+7.94
Iowa	40,512	41,821	36,453	+14.72	274,357	262,523	+4.51
Kansas	48,207	40,566	34,643	+17.10	277,563	257,558	+7.77
Kentucky	18,993	20,163	18,168	+10.98	130,864	119,782	+9.25
Louisiana	15,981	16,915	15,697	+7.76	118,721	115,117	+3.13
Maine	15,079	16,246	15,434	+5.26	78,375	76,014	+3.11
Maryland	21,500	22,110	19,840	+11.44	141,866	134,497	+5.48
Massachusetts	63,348	63,942	61,243	+4.41	398,016	385,129	+3.35
Michigan	85,089	84,719	76,232	+11.13	559,401	520,033	+7.57
Minnesota	46,866	50,139	43,695	+14.75	296,252	280,645	+5.56
Mississippi	13,958	13,592	11,499	+18.20	94,975	84,342	+12.61
Missouri	47,854	50,224	45,159	+11.21	329,913	322,928	+2.16
Montana	10,662	12,085	9,959	+21.35	64,351	57,894	+11.15
Nebraska	22,927	22,295	20,662	+7.90	148,940	150,166	—0.82
Nevada	2,813	2,912	2,506	+16.20	17,503	16,280	+7.51
New Hampshire	8,695	9,905	8,866	+11.72	48,842	46,673	+4.65
New Jersey	69,325	69,411	70,934	—2.15	481,605	465,614	+3.43
New Mexico	5,818	6,636	5,691	+16.60	40,674	35,627	+14.17
New York	165,628	170,060	160,083	+6.23	1,059,328	1,034,820	+2.37
North Carolina	25,581	28,880	25,879	+11.60	196,530	174,607	+12.55
North Dakota	12,920	13,482	10,784	+25.02	81,444	67,114	+21.35
Ohio	96,732	96,332	91,328	+5.48	664,623	629,404	+5.59
Oklahoma	32,245	30,584	26,026	+17.51	214,880	199,817	+7.54
Oregon	19,087	19,162	15,805	+21.24	119,400	111,386	+7.19
Pennsylvania	98,200	114,789	110,521	+3.86	768,763	743,271	+3.43
Rhode Island	12,343	12,235	11,191	+9.33	75,277	72,267	+4.16
South Carolina	12,768	13,240	11,515	+14.98	94,552	85,544	+10.53
South Dakota	12,577	12,094	9,680	+24.94	80,668	70,939	+13.71
Tennessee	21,104	21,612	19,334	+11.78	145,645	136,815	+6.45
Texas	88,922	88,560	77,454	+14.34	618,639	567,038	+9.10
Utah	7,665	7,369	6,638	+11.01	46,065	42,458	+8.49
Vermont	5,944	6,731	6,399	+5.19	32,869	31,300	+5.01
Virginia	27,219	27,365	24,729	+10.66	184,005	168,946	+8.91
Washington	28,287	28,725	24,833	+15.67	179,818	176,314	+1.99
West Virginia	17,241	15,893	14,495	+9.64	106,281	94,642	+12.30
Wisconsin	45,667	47,622	42,053	+13.24	288,688	277,151	+4.16
Wyoming	6,179	6,072	4,916	+23.51	32,447	29,384	+10.42
Total	1,718,003	1,744,505	1,581,436	+10.31	11,523,446	10,874,025	+5.97
Daily Average	55,419	56,274	51,014	+10.31	47,422	44,749	+5.97
Change from previous year: Total Change		+163,069			+649,421		
Percentage Change in Daily Average		+10.31%			+5.97%		

Complete Inspection Trip

TULSA, Nov. 9.—Several Standard Oil Co. of New Jersey officials from New York completed their annual inspection trip through the Mid-Continent Nov. 8. Some of them returned to New York, while others went to Los Angeles for the A.P.I. convention.

Included in the party were E. J. Sadler, P. C. McComb, S. P. Coleman, H. L. Shoemaker, George Stewart, F. W. Abrams, Dr. H. G. Burks, A. B. Gregory and H. G. Eklof, all of the eastern offices.

Half of Oklahoma Tax Comes from Oil

OKLAHOMA CITY, Nov. 9.—More than half of the total tax collections in Oklahoma from July 1 to Nov. 1 came directly from the oil industry. A total of $14,237,000.99 was collected during that period from 23 sources, according to the Oklahoma Tax Commission. Of this amount, $8,425,242.34 was paid exclusively from the oil industry's pockets in the form of gasoline and petroleum excise and gross production taxes. The approximately eight and a half million dollars paid exclusively by the oil industry does not include taxes paid by it on motor vehicle, sales, freight car, sales, and gross receipts taxes.

An increase of $4,264,412.77 in tax collections during the July 1 to Nov. 1 period over the same period last year was reported by the commission. Increased collections from the gasoline excise and gross production taxes accounted for more than two and a quarter million dollars of the total increase.

Tide Water Oil Moves Chicago Offices

CHICAGO—The Chicago office of Tide Water Oil Co. was moved Nov. 11 to the Carbide & Carbon Bldg., 230 N. Michigan Ave. Telephone numbers are Central 9136-7-8.

The move from the old address, 1445 W. 37th St., was made over the week-end, R. V. May, Chicago department manager, announced.

The company's warehouse at the W. 37th St. address will be maintained until Dec. 1 when another announcement will be made of the new warehouse location.

More British Synthetic Gasoline

LONDON, Oct. 27.—The National Coke & Oil Co., Ltd., one of the new enterprises now producing gasoline from coal in the United Kingdom, announces that the third retort of its plant at Tipton has just been brought into full operation. Deliveries of gasoline will be substantially increased.

On The Lazy Bench

A goat ate all our jokes
And then began to run,
"I cannot stop," he gayly said,
"I am so full of fun."

—The Diamond,
Mid-Continent Petroleum Corp.

—N P N—

Rather Costly

"How much does it cost to run a death notice in your paper."

"Fifty cents an inch."

"My Gawd! And he was six feet tall!"

—National Dixie Booster,
Dixie Distributors, Inc.

—N P N—

The Main Thing

O stop and let the train go by,
It hardly takes a minute;
Your car then starts again intact—
And what is more you're in it.

—National Dixie Booster,
Dixie Distributors, Inc

—N P N—

Crime Does Not Pay

Husband: "No matter what a man steals, he will live to regret it."

Wifey: (Very coyly): "You used to steal kisses from me, dear, before we were married."

Hubby: "You heard what I said."

—The Sunoco Diamond,
Sun Oil Company

—N P N—

No Foolin' Then

A girl may wear a golf outfit when she can't play golf, a bathing suit when she can't swim, and a riding habit when she goes hiking, but when she puts on a wedding gown, she means business.

—The Diamond,
Mid-Continent Petroleum Corp.

—N P N—

All in Favor of the Motion—

"I'm starting a world-wide movement against cosmetics. Powder shall never touch my nose!"

"So you intend to be a shinning example?"

—The Diamond,
Mid-Continent Petroleum Corp.

—N P N—

Couldn't Stay Put

Driving through the mountainous part of Arkansas, tourist notice a man with plow and team lying in the road.

"What happened?" asked the tourist.

The old farmer jerked a thumb upward and ejaculated: "Doggone it, I'm going to quit plowin' in that co'n field up thar. That's the third time I've fell out of it today."

—National Dixie Booster,
Dixie Distributors, Inc.

—N P N—

So Easy

Joe: "What is the advantage of the knee-action wheel?"

Moe: "Well, you see, the wheels give. So, if you run over a pedestrian, you hardly feel it."

—National Dixie Booster,
Dixie Distributors, Inc.

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A British chemist or chemical engineer with experience in petroleum refining wanted for British Colony. Permanent position and prospects for right man. Apply giving details of qualifications, experience and salary required.

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For Sale

ADVERTISEMENT—CALL FOR BIDS to purchase Royalty Oil and Royalty Gasoline Accruing to the United States from the Salt Creek, Wyoming, Oil Field. Sealed proposals, in duplicate, will be received in the office of the Secretary of the Interior, Washington, D. C., on or before noon December 2, 1935, from responsible bidders for the purchase, beginning January 1, 1936, of royalty oil and royalty natural or casinghead gasoline accruing to the United States from Government lands in the Salt Creek, Wyoming, oil fields. Detailed specifications on quantities offered for sale, required form of bids, deliveries, volume measurements, gravity determinations, bond requirements, and action on bids, should be obtained by prospective bidders from the Director, Geological Survey, Department of the Interior, Washington, D. C., the Supervisor, U. S. Geological Survey, Casper, Wyoming, or the Register, U. S. Land Office, Cheyenne, Wyoming. Sealed bids are to be submitted to the Secretary, Department of the Interior, Washington, D. C, pursuant to the specifications, the envelope to be marked plainly "Bid on Salt Creek Royalty Oil (Gasoline)." No bid received after the time herein fixed for submitting bids will be considered. (Sgd) HAROLD L. ICKES, Secretary of the Interior.

Advertisers having box numbers should be addressed in care of National Petroleum News, 1213 West 3rd Street, Cleveland, Ohio, unless otherwise specified.

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Light Diesel Engine Developed

WASHINGTON—A so-called "light" diesel engine has just been constructed by a Danish company, according to advices to the Commerce Department from its Copenhagen office. This company, it is pointed out, was one of the first in the world to manufacture diesel engines.

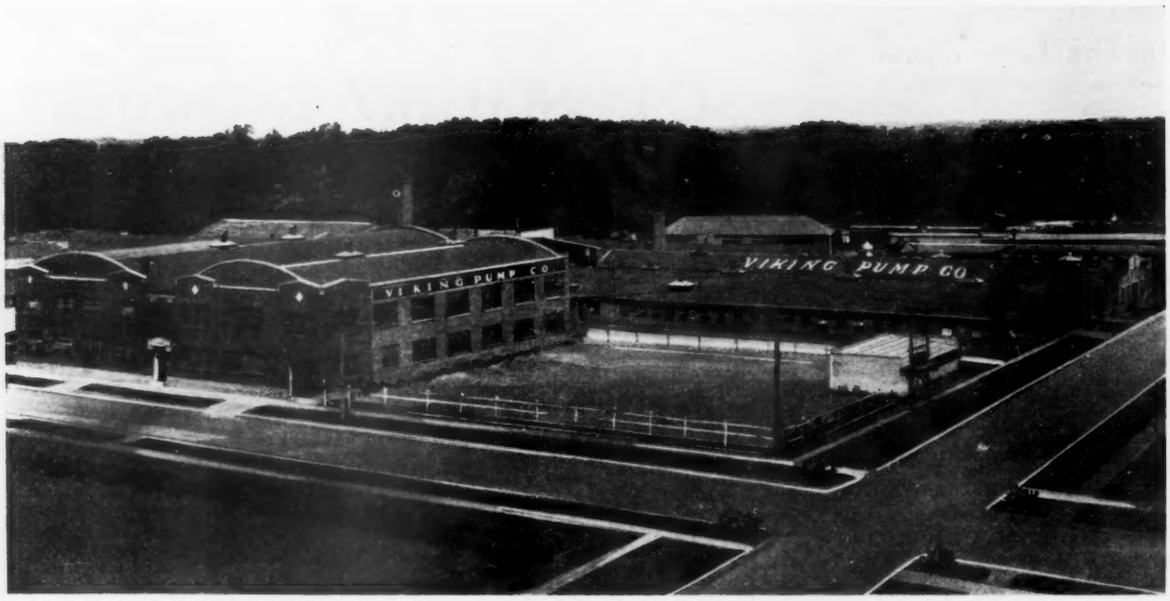
The newly constructed engine is said to be well adapted for highspeed, cheaply-run motor boats for naval as well as civil purposes, or for motor trucks, it was stated.

The engine in question is of 75 horsepower and weighs only 1650 pounds. During the trials, when making 1600 revolutions, it is reported to have propelled a 35-foot boat at a speed of 15½ knots per hour.

K. C. Dailey Dies

OKLAHOMA CITY, Nov. 6.—K. C. Dailey, who was one of the early-day operators in the Osage, Drumright and Cushing pools, died here Nov. 6 following a heart attack.

Mr. Dailey came to Oklahoma in 1905, and settled in Osage county. For two years he was gas and oil inspector at Drumright for the U. S. Department of the Interior.



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to over 400,000 Viking Rotary Pumps

STARTING with a one room factory and two men in 1911 . . . the Viking Pump Company today occupies the world's largest factory devoted exclusively to the manufacturing of rotary pumps.

If the first rotary pumps produced by Viking could return to the original humble old home they would find it had been replaced by a modern plant comprising approximately 100,000 square feet of floor space, exclusive of the 21,000 square feet occupied by the iron and brass foundries.

In addition to a finely equipped factory, the Viking plant includes a modern designing and engineering department . . . and a complete metallurgical laboratory for the testing and development of new type metals.

Only a pump of proved dependability, efficiency and long life could build such a large business in such a short length of time.

Above: The modern iron foundry of the Viking Pump Company where all iron castings are poured.

Above: The fine metal foundry where all brass, bronze and aluminum castings are made. Viking controls all steps in the production of their pumps from the raw material to the finished product.

VIKING PUMP COMPANY

Cedar Falls, Iowa